• APRIL 1956

BUTANE-PROPANE News

FIFTY CENTS PER COPY

Industrial trucks—
the fastest growing
year round market
for LPG
as motor fuel

HEADQUARTERS FOR L.P. GAS INFORMATION SINCE 1931

Shoulder filling saves operator's time and trouble.

Shoulder filling saves wear and tear on hose.

Shoulder-mounted gauges are easy to read.

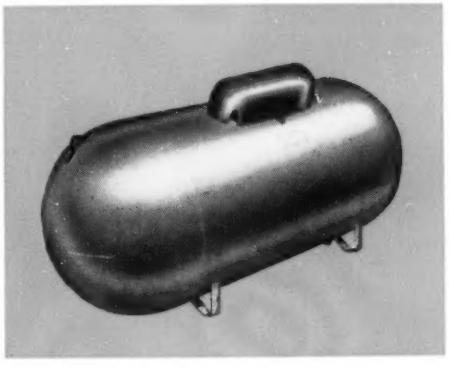
Three reasons why shoulder filling is easier filling

This popular feature of Hackney Shoulder-Connected Systems is easier on your operator...easier on your equipment...easier on your customers. Valve, gauges and other fittings are all conveniently grouped on the shoulder, within reach and at eye level.

More Hackney extra features

Check and compare. See for yourself why Hackney LP-Gas Systems assure long trouble-free service...low maintenance cost... greater safety...well-satisfied customers. Completely equipped with first-quality fittings to meet national *and* local safety regulations. Sturdy, streamlined, seamless hood covers that protect the fittings. Hackney Systems are engineered and inspected to meet ASME and NBFU Specifications. Each tank is hydrostatically tested, and a certificate of inspection is issued for your security.

Automatic welding is X-ray controlled to assure sound, uniform welds. Inside and out, tanks are free of scale, rust, oil and moisture. Carefully spray-painted for protection against the elements. Send for our new bulletin on Hackney LP-Gas Systems.



Hackney Model S499 Shoulder-Connected System. Other shoulder-connected models include capacities of 640, 995 and 1135 gallons. Other Hackney Systems: end-connected, top-connected and underground models in several sizes.

Pressed Steel Tank Company

Manufacturer of Hackney Products

1487 South 66th Street, Milwaukee 14, Wisconsin

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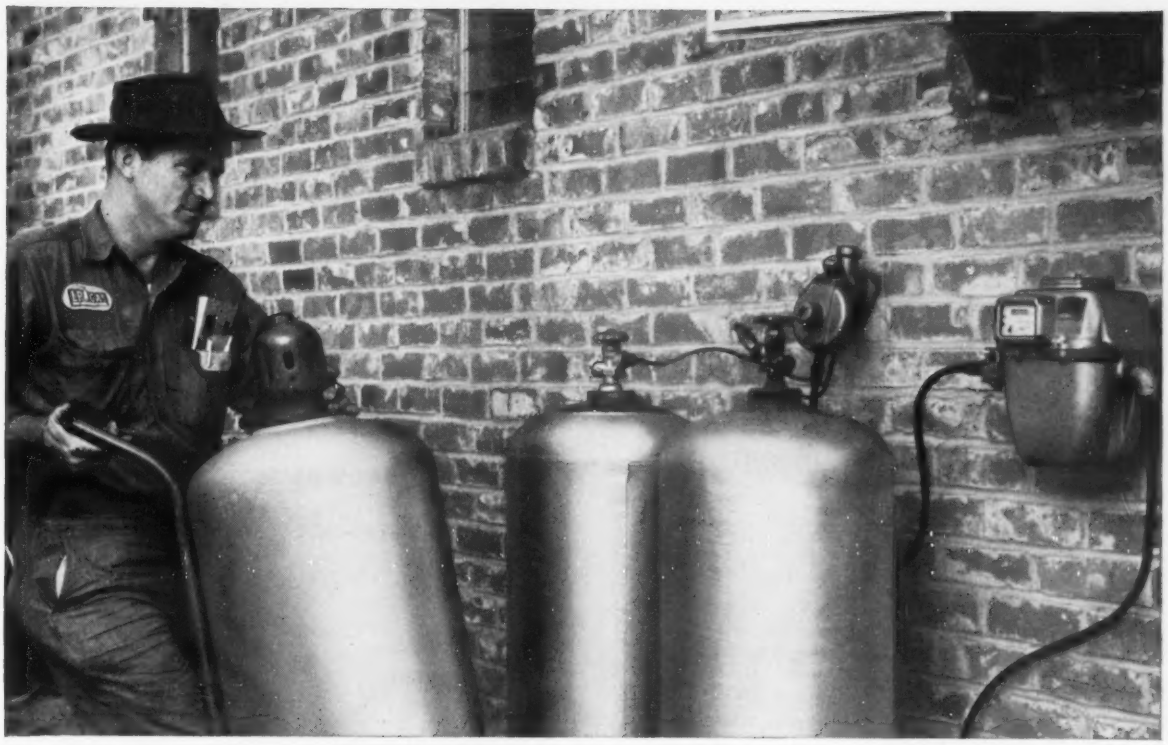
LP-GAS CONTAINERS FROM ONE POUND TO 30,000 GALLONS

Sell More Gas



with ROCKWELL LP-Gas METERS

The meter you need!

The Rockwell LP-Gas meter is cased in a strong, weatherproof aluminum alloy housing. It has ample capacity for both today's and tomorrow's loads. Mounting brackets simplify installation.

Metered outlets give you a strong selling argument for LP-gas service. Your customers and potential customers want them, for with meters you can offer "city type" service. Meters inspire *confidence* by identifying your business with the gas business. And they effect many distribution economies. Get full facts on all meter system advantages by writing us today.

ROCKWELL MANUFACTURING COMPANY

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In Canada: Rockwell Manufacturing Company of Canada, Ltd., Toronto, Ontario

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APRIL 1956
Volume 18, Number 4

POWER SECTION

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At Contract Time...
Do You Weigh Price Alone?

Bargain basement shopping doesn't mean much if the merchandise isn't there when you need it most.

After Last Winter, why not weigh a fair price with all the advantages of a ***WARRENGAS*** *Contract before you sign on the dotted line.*

You can get the details by contacting our nearest sales office . . .

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the Concentrated fuel
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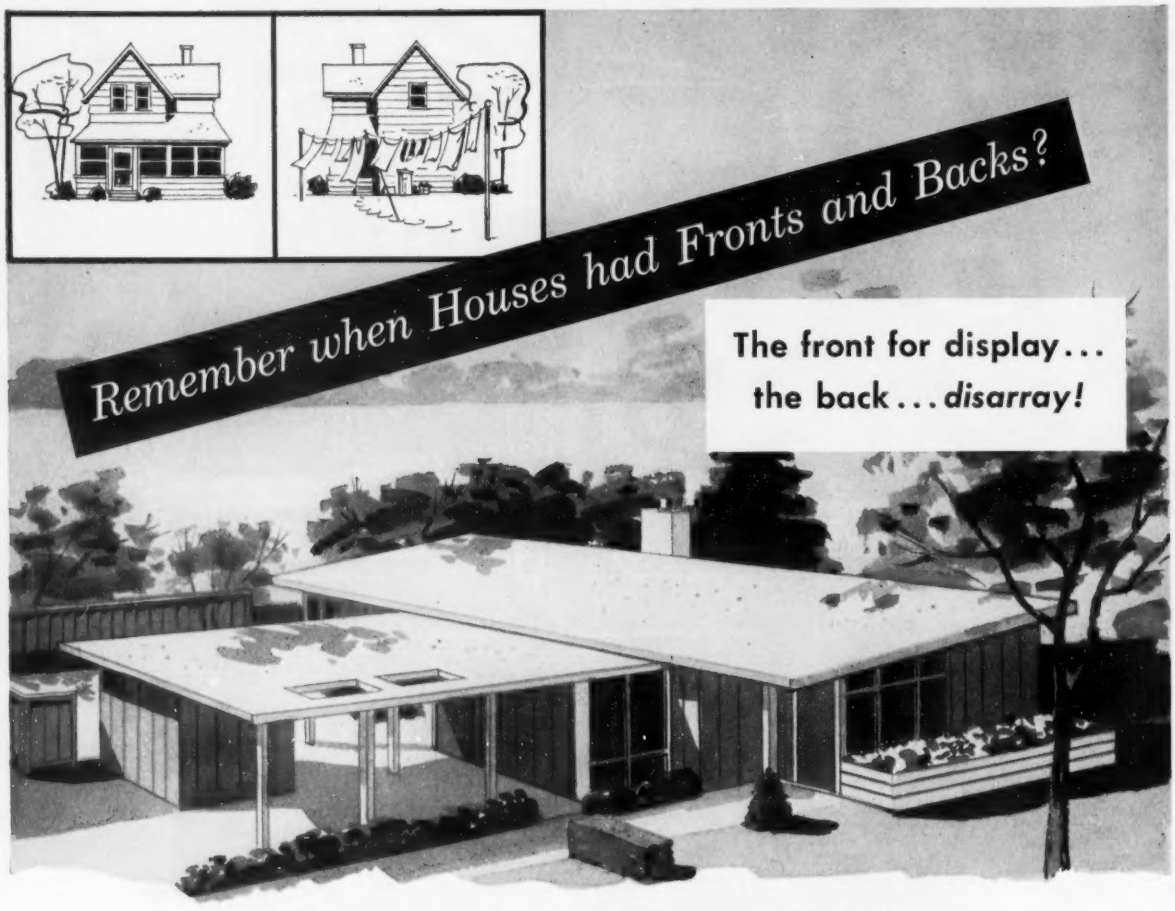


Today they're on All-Round Display!

That's one reason for the big sales boom in clothes dryers.

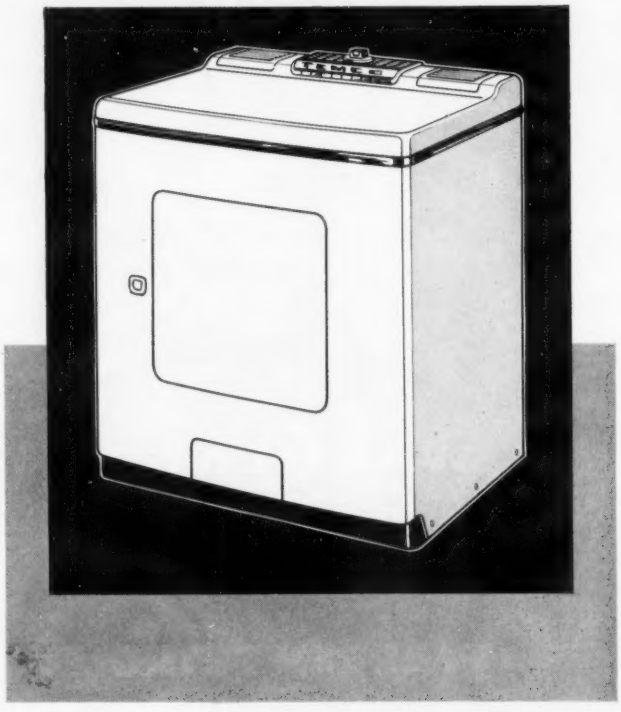
And another reason is the quality of the dryers themselves—more convenient, more dependable than ever before—features that thousands of dealers associate immediately and automatically with the . . .

TEMCO AUTOMATIC GAS CLOTHES DRYER!

And here are three Temco EXCLUSIVES!

- **Wonderful Mistaway—Temco's specially developed high velocity blower.**
- **Knee-High Push-Button Door—handiest to open of all dryer doors.**
- **Exclusive Sun Dial—just one control to set.**

It's competitively priced, too—your passport to local leadership in the clothes dryer field!



Remember 1956?

Yes, this will be a year to remember, because . . . More new homes are going up faster than ever before . . . more of them are heating with gas than ever before . . . and more have brand new Temco Heaters than ever before. That's why Temco and its dealers are now enjoying their most prosperous year in history!

These are the headline selling features!

- **20-year written warranty on Porcelain Enamel Heat Chamber.**
- **Handsome contemporary design.**
- **Cabinets finished in "Lifetime" Porcelain Enamel.**
- **Approved by A.G.A., guaranteed by Good Housekeeping.**

REPLACEMENT OR REFUND OF MONEY IF NOT AS ADVERTISED THEREIN — Guaranteed by Good Housekeeping

COMPLIES WITH NATIONAL SAFETY REQUIREMENTS — AMERICAN GAS ASSOCIATION — APPROVED

MEMBER NATIONAL LP-GAS COUNCIL

TEMCO, inc.

NASHVILLE 9, TENNESSEE

"Gas Heating Specialists for the Nation"

"THE COMPLETE LINE OF GAS HEATING EQUIPMENT"

ROOM HEATERS • FLOOR FURNACES • WALL HEATERS • UNIT HEATERS
WARM AIR FURNACES AND AIR CONDITIONING

SEND THIS COUPON FOR THE FULL STORY:

TEMCO, INC., Department B-624
Nashville, Tennessee

Please send me catalog and complete story on Temco's automatic gas heaters. ☐, clothes dryer ☐.

Name .....

Firm Name .....

Address .....

City ..... Zone ..... State .....

Now... A complete line of

MODEL 200

MODEL 400

Robertshaw-Grayson thermocouples and pilots belong together — because they are designed to work together.

Air-gap construction throughout prevents water entering gas lines.

standardized controls

Now, for the first time, a complete line of water heater controls standardized to cut your costs. Water heaters are big business and accessories, too, should be handled in a big business way. That's why standardization plays such a big part in the new Unitrol line. All have 100% shut off. All adjustments are readily accessible from the front. Many parts are interchangeable such as magnet assemblies, filters and valves. These controls are also interchangeable for standardization of manifold piping – all of which add up to reduced inventories, standard servicing and reduction in engineering time.

MODEL 110

Robertshaw®-Grayson®

UNITROL®

America's most beautiful water heater controls **BY WORLD'S LARGEST MANUFACTURER**

MR. CONTROLS

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SELECT THE CONTROLS THAT HELP YOU SELL

WEIGHT CLASS! CHEVROLET

New Chevrolet trucks for '56 bring you new heavies, middleweights and lightweights in eight great new series—new power and performance to save more money on your hauling job!

New Heavyweights—New Tandems! All-new heavyweights in 9 wheelbases, with maximum G.V.W. ratings up to a new high of 32,000 lbs.; G.C.W. up to 50,000 lbs.

Ultra-Modern Features! Tubeless tires, standard; High-Level ventilation and panoramic visibility; plus Concealed Safety Steps on most models.

Wider Range of Drives! There's an automatic drive in every series with new Powermatic for most middleweights and heavies; Hydra-Matic for light-duty models. Both extra-cost options. A new 5-speed transmission is standard in 9000 and 10000 series models; optional at extra cost in other heavies and most medium-duty models. New heavy-duty 5-speed is an extra-cost option in models with new Loadmaster V8.

A Modern V8 for Every Model! And introducing the completely new 322-cu.-in. Loadmaster V8, standard in new 9000 and 10000 series heavyweight models.

See Your Chevrolet Dealer and his new Task-Force line before you buy. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

TASK·FORCE TRUCKS

Here's

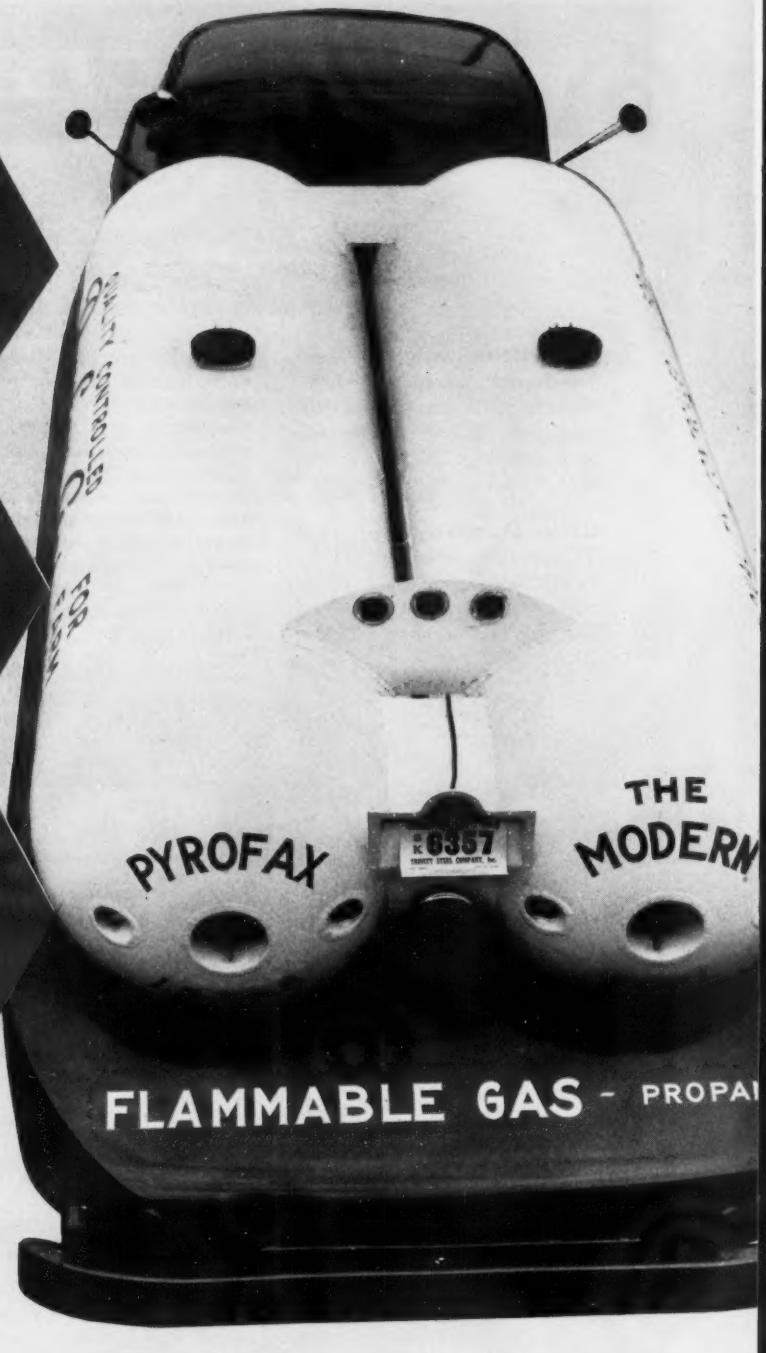
TRINITY'S

PROFIT BUILDING

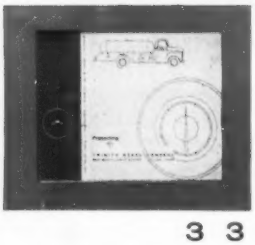
SILVER ANNIVERSARY MODEL *

106

and it's features



*In commemoration of LPGA's 25th Silver Anniversary.



the NEW TRINITY STORY

Write today for your beautiful 16-page booklet covering the entire Trinity line of truck tanks, storage tanks and transports.

MEMBER LIQUIFIED PETROLEUM GAS EQUIPMENT INC. LPGA

Trinity goes to Mexico

— TATSA —

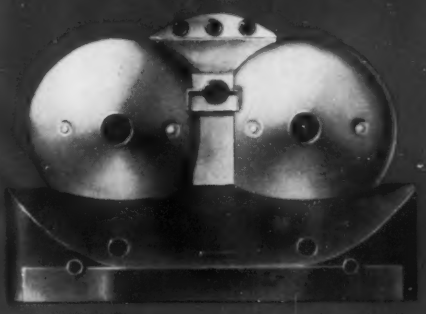
Tanques de Aceros Trinity

S. A. Calle Poniente 150-#734

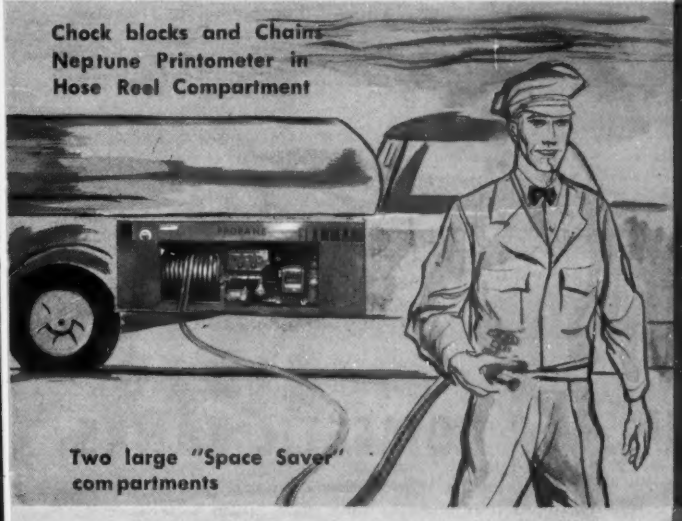
Mexico 16, D.F.

3301 SOUTH LAMAR STREET

Trinity's famous 106 has now become the most popular twin-barrel unit available to LPG distributors. The ruggedness, economy, and beautiful design that is built into each 106 is your guarantee of performance and dependability...



Neatly designed sectional skirting, complete ICC Stop and Directional lights, recessed thermometer, Rotary and Pressure Gauges.



Chock blocks and Chains
Neptune Printometer in Hose Reel Compartment

Two large "Space Saver" compartments

TAKE ADVANTAGE OF THIS MONEY-MAKING TRINITY BONUS

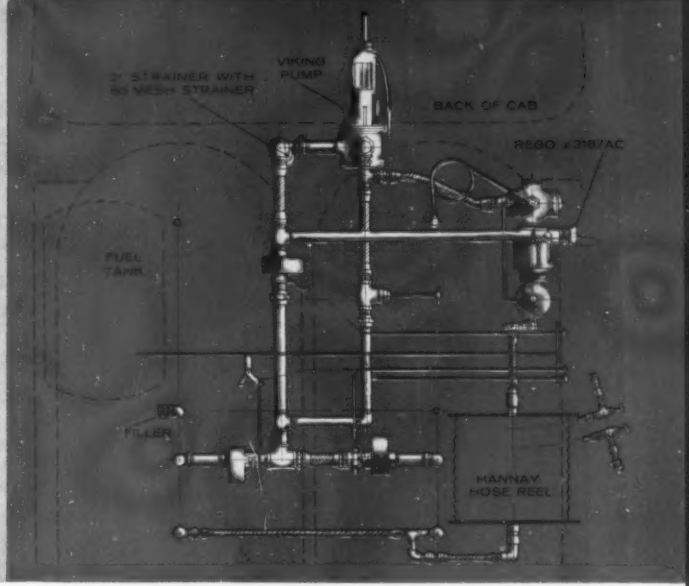
- Advanced designs
- Rugged construction
- Quality materials
- Low operating costs
- High payload profit
- TRINITY Know-How

Built-in quality is the real secret of the 106. Precision-engineered plumbing especially designed for ease of operaton, repair or replacement – made of the finest materials available.

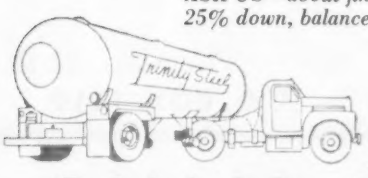
SPECIFICATIONS

Models 106 "The Perfect Unit" constructed under 1952 Code 250 lb WP and ICC MC-330.

- 1400 WG or 1700 WG capacity
- ICC and large 7" Stop Light
- 38 WG Fuel Tank
- KK-200 Viking Pump, 38 gpm
- Dual Hewitt-Robbins liquid and vapor hoses mounted on Double Hannay Hose Reel
- Two coats DuPont Enamel over Red Oxide
- Rear directional lights
- Remote control Okadee Valves
- Remote Control (vacuum-cylinder actuated) power take off and clutch in Meter Compartment



ASK US—about financing your new trucks, 25% down, balance monthly.



TRINITY STEEL COMPANY, INC.

EVEREADY GAS SYSTEMS

DALLAS, TEXAS • HA 8-8321

MAKING IT POSSIBLE FOR EXPAND AS THEY GREW

Some of today's largest users of Nor-Tex products bought their first tank and delivery unit from us years ago. Many times, when storage and delivery requirements increased, the methods and tanks we suggested proved out, permitting normal, uninterrupted growth at a minimum cost. With the building and supervision of Nor-Tex tanks entirely in the hands of men with years of bulk plant experience one can more accurately determine the right size tanks and the safe prices to pay to assure a profitable operation for the dealer. This bulk plant experience has resulted in many helpful, time-saving "extras" that have won Nor-Tex many customer friends.

STANDARD TWIN

Business small? Just getting started? Wherever you are located, the Nor-Tex Standard Twin is your best buy! This streamlined twin unit (1200 thru 2400 WG) is completely piped and ready to use with Viking mechanical seal pump, 50' filler hose, ICC lights, P.T.O. and splines jack shaft. A complete "Package Unit."

DE LUXE TWIN

Here is the choice of the fleet owner! It is the finest looking unit on the road with plenty of big, roomy cabinet space. It is a complete unit (1200 thru 2400 WG) with Viking mechanical seal pump, 50' filler hose, ICC lights, P.T.O., splines jack shaft and it is all piped and ready to use. A complete "Package Unit."

EXTRA SAVINGS on Complete

Buy one or a truckload.

POPULAR Nor-Tex STAR DOMESTIC TANKS

Each tank is fabricated to rigid specifications by men with years of domestic tank installation experience. They're double tested . . . "*Built to Last a Lifetime.*" They meet all national, state and local requirements. It is the safest, finest quality tank you can buy! Smoothly finished and aluminum painted over red oxide. Complete satisfaction guaranteed.

Immediate Delivery

Balance Your Load the Nor-Tex Way

•

Finance the Balance

Manufacturers of Fine LPG Equipment

Whatever your needs in LPG equipment there is a factory tailored Nor-Tex unit ready for you! We manufacture LPG Truck and Transport Tanks, and we are truck distributors. We manufacture all types of LPG Tractor and Motor Fuel Tanks, Portable LPG Filling Stations and Trailer Tanks, LPG Storage and Domestic Tanks, Farm Carts and Anhydrous Ammonia Tanks, all built by men with years of Butane-Propane bulk plant experience. Phone, wire or write us. Interested attention, experienced assistance and helpful suggestions are always yours for the asking.

Nor-Tex PRODUCTS COMPANY

National Sales Agents for

NORTH

P. O. BOX 1219

MANY LP-G DEALERS TO BUILT THIS BUSINESS

Nor-Tex Units Earn More! Cost Less! Do the Job Quicker and Easier!

"Biggest LP-G Year Ever Ahead," is the report from everywhere. Slash delivery costs with Nor-Tex High Flow Piping Units! Perfectly Balanced! Famous for loading and delivering LP-Gas *faster!*

PAYLOAD SPECIAL

Get immediate delivery on this internationally popular Nor-Tex twin and save money, too! It has everything you need in sizes from 1200 thru 2400 WG. Viking mechanical seal pump, 50' filler hose, ICC lights, P.T.O., splines jack shaft and it is completely piped and ready to use. A complete "Package Unit." *(Model illustrated.)*

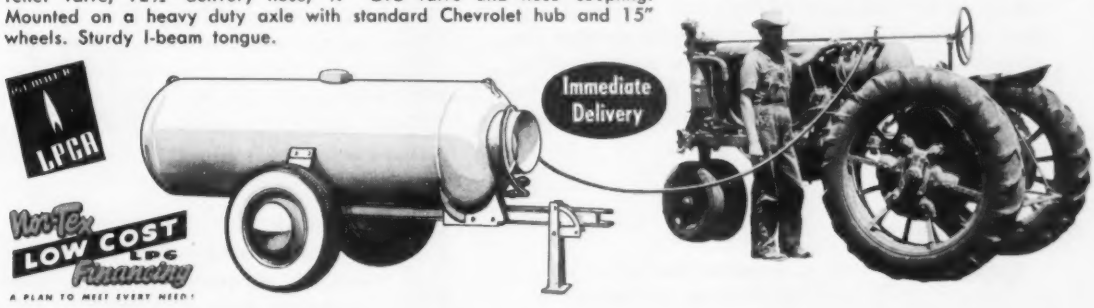
AUTHORIZED TRUCK DISTRIBUTORS

Nor-Tex PIPE-IT-YOURSELF "Package Units" — Nothing More To Buy!

Nor-Tex FARM CART—*Spots Your Fuel Where You Need It*

Farmers save many hours by placing their fuel supply right where they need it with the well-baffled Nor-Tex Farm Cart. It is completely safe and easy to "spot" with car, truck or tractor. Complete with recessed relief valve, 12½' delivery hose, ¾" OIC valve and hose coupling. Mounted on a heavy duty axle with standard Chevrolet hub and 15" wheels. Sturdy I-beam tongue.

NOTE: All Nor-Tex Star Domestic Tanks of 500 WG or more include a convenient liquid line outlet for wet line connection to tractor fuel tank.



Make It Easy and Convenient for Customers to BUY and USE LP-Gas

Nor-Tex "PONIES" (strategically placed for best distribution) can substantially boost year 'round sales and quotas. Operate them yourself or arrange with highway service stations to dispense LP-Gas for you. Nor-Tex portable "PONIES" can be easily placed on farms, ranches, in truck and bus terminals and "on-the-job" for contractors and utility companies. Nor-Tex "PONIES" meet all requirements — U-69 — W250 Codes. Sizes: 500, 700, 1000, 2000, 3000 and 4000 WG. Available with your choice of pumps, meters and accessories.

TEXAS TANK CO.

DENTON, TEXAS **CENTRAL 5416**

New

NEPTUNE BLUE SEAL LP-GAS VAPOR METERS

for gas metered service

Neptune, long the leader in liquid LP-gas meters, now proudly introduces the Blue Seal vapor meter for LP-gas dealers who feature gas-metered service.

Only 9 inches wide, the new Blue Seal accurately records all LP-gas consumption ranging from pilot burner to full household load. Its sturdy brass case is thoroughly weatherproof for outside settings.

Design of the new Blue Seal is based on the two-diaphragm slide valve used for over a century by gas utilities, with a fine record for long life, sustained accuracy and low maintenance. The new Blue Seal is manufactured by experienced craftsmen at Neptune's Superior Meter division, makers of fine gas meters since 1912. And it's moderately priced. Get all the facts today. Call your nearest Neptune branch office.

New Blue Seal Bulletin now ready for your files. Ask for it today.

NEPTUNE BLUE SEAL NP-40 LP-GAS VAPOR METER

RATED CAPACITY:
42 cfh propane, 37 cfh butane

WORKING PRESSURE:
2 lbs. per sq. in. maximum

DIMENSIONS:
11⅜" high, 9" wide, 7½" deep

CONNECTIONS:
Std. male flared, for ⅜" copper tubing

INDEX:
Direct reading or dial reading, calibrated in cubic feet, pounds, therms, decitherms, gallons, etc.

BLUE SEAL LP-GAS VAPOR METERS

neptune

BS 6

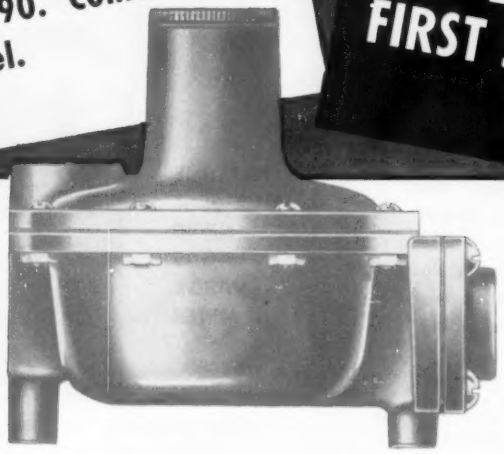
Accuracy You Can Bank On

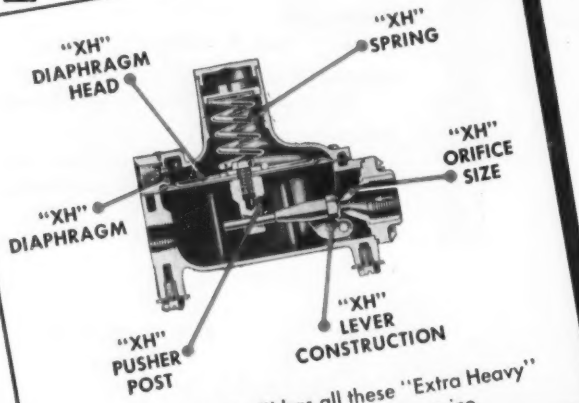
NEPTUNE METER CO., 19 West 50th St., New York 20, N. Y. *Canadian Factory:* NEPTUNE METERS LTD. Toronto 14, Ont.

FISHER® BIG RED

FIRST STAGE REGULATOR Type 922H

Look for this and other new LPG equipment developments at the Fisher booth at Chicago in May. Booth numbers 87 - 88 - 89 - 90. Conrad Hilton Hotel.





Type 922H "Big Red" has all these "Extra Heavy" features for rugged high pressure service.

FISHER *Big Red*

Type 922H Pol x ½" FPT high pressure regulator for first stage pressure reduction on 2 stage bulk systems.

Tank pressures down to

5 psi (0 to 5 psi)
10 psi (5 to 10 psi)
15 psi (10 to 15 psi)

FISHER GOVERNOR COMPANY · Marshalltown, Iowa
CANADIAN PLANT: WOODSTOCK, ONTARIO
LEADS THE INDUSTRY IN RESEARCH FOR BETTER GAS PRESSURE CONTROL

FISHER *Since 1880*

Letters

Burners go out—why?

Oregon

We have run into a peculiar problem and naturally when we run into these kind of problems, we first think of you for the answers.

Our servicemen and truck drivers have informed us several times now they have run into the situation where they have filled a propane storage tank with gas and that shortly thereafter, or immediately thereafter, all of the appliances served by this tank go out. The tanks have not been overfilled.

The only thing that we can find in common on these instances is the fact that the systems have 2-stage regulators on them.

Can you explain this peculiarity to us?

R.L.B.

It is difficult to diagnose troubles and recommend corrective measures by long distance engineering. Generally, all the facts are not included in the correspondence because seeming unimportant facts, and often some rather important points are omitted. This, we believe, is the case with your problem.

The information you have conveyed in your letter makes only two points definite: (1) The appliances go out immediately or shortly after the tank is filled. (2) It happens only on systems using 2-stage regulation.

A third point may be assumed by the wording of your letter, but this is not certain and may be the key to your whole problem. This is the section which states, "Wherein they have filled the storage tank with gas." Is this a refill, or is it the initial fill when the tank is just installed?

If it is the initial fill after the tank is installed the trouble is undoubtedly air that was in the tank and is now mixed with the gas. The flame will lack heat and cause the pilot flames to weaken and cause the safety shut-off to close. The answer in this case would be to open the service valve to the atmosphere after filling and let the gas mixture blow out of the tank before connecting the tank to the system. It is then necessary to purge the lines of all air before the burners will function properly.

However, your letter indicates, by the wording, that the trouble happens on systems which have been in service and the trouble occurs when the tanks are refilled.

There is no reason why either regulator should act abnormally during or immediately after the filling operation than at any other time. Secondly, if there are defective regulators or equipment, why should they malfunction at the time they are filled or immediately afterwards and not at any other time? Or is something being overlooked and the trouble is encountered at other times?

Is it possible the trouble has occurred on single-stage installations, and is being overlooked?

What are your drivers doing, exactly? Are you getting the entire story? How is the hose handled? Is there any possibility a little air is getting into the hose and entering the tank? We don't think this is likely, but some seemingly minor thing is causing your trouble.

I have discussed your problem with some of the regulator people here in town, but they can see no reason for the trouble on the basis of the information which you have submitted.—Ed.

Three-way valves needed

Paris, France

The use of propane in liquid form is in full development in France and that has led to the use of vaporizers. We are faced with a problem concerning the liquid supply to those vaporizers from containers and another problem of automatic reversing of the supply from one container to another. That must be done without cutting off the liquid supply.

Please send us any information about the method of reversing and indicate what apparatus we can use.

P.A.

We do not know of a valve or device for automatically changing the flow of liquid from one tank to another.

Generally, where one or more tanks are in a group liquid is withdrawn from the entire group as a unit or manually shifted from tank to tank.

If it is desired to provide a valve that can be installed in the lines feeding from two tanks and then through a common line to the vaporizer, which valve will permit flow from only one or the other of the tanks at one time, then such valves are avaliable. These we term three-way valves. However, they are manually operated valves and it would require considerable ingenuity and expense to make one automatic.

It is recommended that steel valves be used.—Ed.

Make bakery installation safe

Iowa

We have a bakery account that is planning on moving to a new location which is in the center of our business district with no alley in the immediate area. It is a corner building fronting on the main street with a 6-ft sidewalk along the side street.

We are wondering how and what type of storage for L. P. gas would be practical in this location. They are now using a 500-gal. L. P. gas tank.

C.F.D.

We cannot see how it will be possible for you to safely install an L. P. gas storage tank on the property adjacent to the new bakery building.

The location on the sidewalk is not suitable because it would be too close to the building and the street; it would be subjected to exposure from open flames carried by pedestrians going by, smoking or lighting cigarettes, cigars, etc., and would lack protection from automobiles or other vehicles which might get out of control and strike it. We see no way for you to make a safe and satisfactory tank installation on the property where the bakery will be located.

There are, however, two possible solutions:

1. There may be adequate property in the rear of one of the adjacent buildings on which you can make arrangements to locate a storage vessel (500 or even 1000 gal.) in accordance with recommended safe practices and all governing codes. The gas from this vessel can then be piped underground and to the bakery. There may be some difficulty in getting between the buildings, making it necessary to pipe

the MASTER
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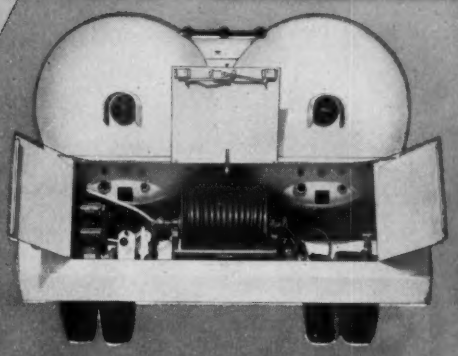
TRUCK TANKS



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Southern Special — 1400-1700 gallons, open rear end and high fittings for regions where ice and snow is uncommon.

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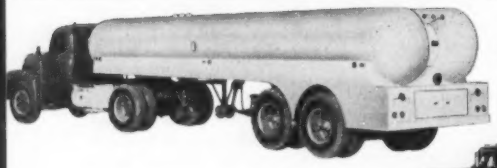
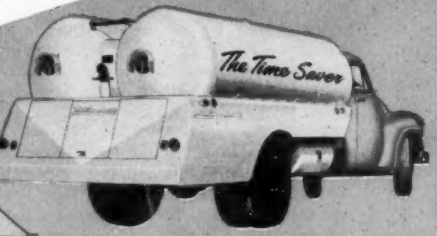
TRANSPORT SECTION...



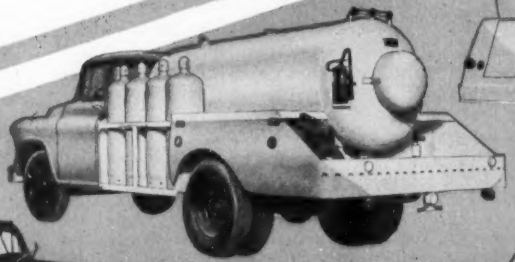
No. 200 LPG and anhydrous ammonia twin barrel transport tanks.

No. 205 Standard LPG and anhydrous ammonia single barrel transport tanks.

No. 210 Master Max with a step-down tank. Lowers center of gravity, increases payload and reduces wind resistance.



Southern Express—1800-2200 gallons, open rear end and low fittings for bulk deliveries down South.



Northern Express — 1800-2200 gallons, low fittings and a closed rear end for protection against ice and snow.

Oil & Gas Special — This unit has a built-in compartment on each side to carry packaged petroleum products . . . large enough for a drum of oil.

Southern Combination — 900 gallon LPG delivery truck with facilities for both bulk and bottle deliveries. A new idea.

"Do-It-Yourself" Kit — For those who prefer to mount their own.

around one of them and come in under the sidewalk. It may be possible to serve three or four of the buildings from the one storage by metering the vapor to each customer.

2. Another solution, which will require considerable capital but which will provide more customers also, is to obtain a franchise and serve the entire town through a piped system.

It is further suggested, if you do not already have them, that you obtain copies of the standards of the National Fire Prevention Association Pamphlets as follows:

No. 58, Liquefied Petroleum Gases.

No. 59, L. P. Gas in Utility Gas Plants.

No. 52, LPG Piping, Appliances in Buildings.

You can obtain copies of the above pamphlets from NFPA, 60 Batterymarch St., Boston, Mass., or from the Liquefied Petroleum Gas Association, 11 South LaSalle St., Chicago, Ill.

You should also obtain copies of your state and local county and municipal codes if existent. We are sure there is at least a state code in Iowa. Contact the office of your state fire marshal. Chapter 101, Code of Iowa (1946) applies.—Ed.

Left-overs

Montana

We have been noticing some left-overs or cold liquids in the bottom of some of our customer bottles the last few weeks. In fact, several customers have brought back trailer bottles and also 100-lb bottles that have been from one-third to one-half full of dead liquid on the bottom.

Our temperature here has been running from freezing to 20° above zero. Evidently this cold or no pressure gas is butane. So far we have had no complaints from our tank customers, but evidently we have been getting butane slipped in with our propane and if this weather stays cold like it is today (10° below zero), we might be in trouble.

We have been buying our supply from two sources, so don't know which way the butane would be coming in if that is the trouble. All our invoices read 100% propane from both ends.

Our big question is, how would an average dealer like us ever tell how much butane was in a load of bulk L. P. gas? We get our gas in 7000- to 8000-gal. loads. We always check the pressure and it seems to always be up to the pressure of gas on hand and in our storage. I have been in this business for 10 years, and have asked several L. P. gas men. and have tried to figure out just how pressures run when butane and propane are mixed. The question is: If half a load of butane (for example) was filled out with the rest propane and pumped with propane pressure, would the pressure stay up to the straight propane pressure at that particular temperature? Or would the pressure drop in direct proportion to the mix? We know from experience that the propane will draw off first and eventually leave the butane if temperatures are low enough.

Now can a small dealer who has no engineering equipment tell just how his loads are running? In our climate it is a must that we get straight propane for our winter load. Please try to answer our problem. We are going to save 100 lb of gas out of each of our next loads and try to figure out just why this tail end is showing up.

J.M.

We know of some dealers who have had similar problems. It was traced back to one refinery in the area. The odd thing in these instances was that pressures seemed to be in line with those to be expected for propane at the temperatures encountered.

However, the fluid that remained in the tanks and cylinders after the propane was used had no pressure and seemed to have a very high boiling point, such as gasoline. The refinery in question would not admit to any irregularities even though the loads were traced to it. No tests were made of the samples, so the nature of the residual matter was not determined.

The vapor pressures of propane-butane mixtures decrease as the butane content increases. (See Fig. 1—"Approximate Vapor Pressure and Heat of Combustion of Butane-Propane Mixtures"—Page 32 of Handbook Butane-Propane Gases (1951 Printing) and also Fig. 4 on page 45.) Also, there are some charts and discussion of the batch vaporization of butane-propane mixtures from tanks on pages 133, 134 and 135 of the same Handbook.

It is difficult to make a field test that will give a satisfactory indication of the relative amounts of butane and propane in a vessel. The best that can be done in the field is to check the temperature and pressure of the fluid in the tank as accurately as possible, and from these tables determine the contents. This does not give reliable results—only an indication at the best—because of the many variables of the pressure, fractional vaporization, inaccurate gauges, etc., that upset the equilibrium of liquid and vapor temperature and pressure.

The only satisfactory method is to take a sample to a reliable testing laboratory equipped to make the proper tests required to determine the composition of the fuel sample. Possibly one of the refineries in Montana or Wyoming is equipped and willing to perform the proper tests.

It is possible that the trouble is at one of your supplier's plants. Since, as you say, you have two of them, it will be difficult to prove from which one the fuel was received. You should, however, bring the trouble to their attention. It may be that the fuel was all right at the refinery, but a car not completely empty of butane was loaded with propane and thereby provided you with a mixture.—Ed.

Oil in Vaporizer

Kentucky

We have two fork lift trucks operating on propane gas and after about a month's operation, we find that the vaporizer reloads up with oil. We are at a loss to explain to our customers where this oil is coming from.

We would appreciate it if you would send us any information you have regarding this condition. We believe that it is coming from the oil used in our compressor when we unload our cars of gas.

R.R.C.

We believe that your analysis is correct—that the oil found in the vaporizers of the two fork lift trucks in question comes from compressor oil being carried over with the LPG.

It might be the compressor in your own plant or one used in some previous transfer of the product from tank to tank.

You should at any rate make a very careful inspection of your compressor and if it appears to be in good condition, get in touch with the supplier of your fuel.—Ed.

Safety in cold climates

British Columbia

Climatic conditions in northern British Columbia create special problems in the safe handling and use of propane and we would appreciate any information that you may be able to give to prevent further accidents in this area.

Distributors in northern British Columbia are delivering propane by tank truck. Temperatures during the winter months often go to —40° F. The lubricants in the transmission, rear end, etc., of the tank trucks stiffen at this temperature and render the vehicles inoperative. Inside storage facilities are, therefore, being erected by distributors for tank trucks. Mechanical ventilation is planned for the storage buildings and will be interlocked with doorways so that when someone enters the building the ventilation system will remove any inflammable gases.

Two tank trucks will occupy a

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building, with a doorway and interlocking ventilation system for each vehicle. No partitions will be installed in the building. Heat will be supplied by explosion-proof propane heaters. Lighting wire will be explosion proof. Do you consider these installations safe, and is there any better way of providing suitable storage for these vehicles?

Another problem has arisen with the use of propane in cylinders in this climate. Cylinders are ordinarily stored outside buildings, but during extremely cold weather the cylinders are brought inside to vaporize the propane. After warming, the cylinders are supposedly replaced outside, but it is doubtful if this is done. What is the best method of using this fuel at low temperatures?

We would also appreciate it if you would advise us if there are any films available for loan showing the properties of liquefied petroleum gases and the safe practices for refueling, storage and maintenance of vehicles using L. P. gas.

R.F.F.

It appears, from the description you have given, that the structure and provisions for heat, ventilation and electric wiring are satisfactory and should prove safe.

How do you handle gasoline transports? An L. P. gas transport ... a pressure vessel and the outlets sealed off with heavy valves. True, leaks may develop or a valve may not be tightly closed and thus permit the escape of gas. On the other hand, a gasoline tanker is not as tightly sealed, and when a vehicle is placed in a heated structure, after being out in subzero weather, the tank and its contents will also warm up and expand. Due to the expansion, vapors will be forced out. Gasoline vapors are heavier and have a greater flammable range in air than L. P. gas.

The above paragraph is not intended as an argument to let down safety precautions with L. P. gas. Carelessness, thoughtlessness, improper instruction, and ignorance of the product are the things that cause most accidents.

We believe your problem regarding cylinders would be helped if two, three or even four cylinders are manifolded together depending on the load. Another thing which may help is to place the cylinder on the leeward side of the house (if there is any lifference when the temperature reaches 40° below) and inclose in a cabinet. Some heat will work through from the house and, secondly, even a thin wall affords some protection. Larger regulators may also prove helpful because the extremely low inlet pressures reduce the capacity of the regulators.

We do not know of any films that are available wihch show the properties of L. P. gas and safe practices for refueling storage and maintenance of vehicles using L. P. gas, but we are enclosing a reprint from our February 1953 issue entitled "The Nature of Liquefied Petroleum Gas." The entire safety series which was published over a period of two years or more is now available in paper bound book form. It is entitled "Safety Is Everybody's Business."—Ed.

Odor from Heater

Georgia

I have a customer who has a 250-gal. propane tank that furnishes gas for his motel heat. When the gas gets low, say 40-50%, it gives off an odor in the rooms. There is no leak that we can find. The heaters are of a vented type.

We are at a loss as to what could cause this odor since he is using propane gas in a propane tank that is the aboveground type but is buried.

J.D.O.

We believe that the trouble your customer is encountering is caused by an excess of odorant which generally accumulates in tanks or cylinders where the fuel is continually drawn off as vapor.

Odorants do not always vaporize at the same rate and in the same proportion as the L. P. gas. This is usually more pronounced in colder climates. Gradually, over a period of time a concentration of odorants and the heavier ends build up in the bottom of the cylinder or tank. As gas is used from the container the lower boiling point gases (propane and/or propylene) will boil off faster than the higher boiling point butanes and other heavier gases. This tends to raise the boiling point of the liquid remaining in the vessel as gas is withdrawn to serve the appliances. As the boiling point of the liquid L. P. gas raises it approaches that of the odorant and increases the amount of odorant in the vapor leaving the tank.

Sometimes the buildup of odorant reaches a point where, when the tank is quite low in liquid content, the gas is over-odorized to the extent that the odorant is not entirely destroyed when the gas is burned in the appliances. This causes the complaint you are now receiving from your customer. It would not normally be expected that this would make any difference on vented heaters, but there is apparently some leakage or spillage of combustion products that reaches the rooms. It is suggested that some ventilation be provided in the rooms and also that the action of the vent flues be checked to ascertain that they are operating correctly.

If the tank can be pumped out you may be able to correct the trouble by "rinsing" the tank out by filling it, then pumping the liquid back into your delivery truck and taking it back to storage and then refilling the customer's tank with "fresh" fuel. It may take more than one "rinsing" to clear the trouble completely. It will also require repeat performances to prevent recurrence of this trouble.

We doubt, however, if the above method can be used because there probably is no connection to the liquid space in the storage tank so that the liquid can be withdrawn. It will then be necessary to dig the tank up, remove it to a remote spot, drain it, steam it out or wash it out with kerosene or similar light oil to remove the excessive oils and odorant, then reinstall it. Be sure to do this cleaning at a remote location for both safety and to avoid creating a nuisance odor where people may think it is L. P. gas leaking. You will find the heavy ends and cleaning solutions removed from the tank have a very foul odor.

A larger tank may help you on this problem. Your customer uses gas fairly fast, at least for short periods of time. This tends to chill the liquid rapidly and, therefore, reduce the odorant evaporation rate. The surrounding ground gradually supplies the heat needed to bring the liquid back to temperature and build up the pressure again.

The larger tank will receive more heat because of the greater contact with the soil and reduce the variation in temperature of the fuel. It will not, however, guarantee the elimination of the trouble. —Ed.

Hazardous procedure

Delaware

We have a problem that we thought you might answer. We have a customer who uses propane and oxygen for cutting. Gas is taken from the tank at tank pressure and mixed with the oxygen. The oil which is in suspension with the gas collects at the end of the cutting torch and appears as a white foam. This causes the torch to splutter.

The customer is concerned because he is in doubt as to whether the oil might be dangerous when mixed with the oxygen. The only thing that we could suggest to him was that he place a drip tee directly after the gas leaves the regulator to pick up the oil with instructions that it be drained periodically.

I would appreciate if you would give me any suggestions that might be helpful.

M.L.

There is a danger if the oil mixes with the oxygen. Oxygen and oil coming in contact with each other can, and usually do, react with explosive force.

There are a number of companies manufacturing oil separators and or filters which can be placed in the gas line downstream of the regulator. Several companies that manufacture these oil separators advertise in **Butane-Propane News**.—Ed.

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TULOMA GAS PRODUCTS COMPANY

PHONE CHerry 2-3261 - BOX 591 - STANOLIND BUILDING - TULSA 2, OKLAHOMA

beyond the mains

COLD CUSTOMERS, INDUSTRY ECONOMICS, AND GOVERNMENT CONTROL. There were cold customers in some places during the past winter. Therein lies a warning. The industry does not want it to happen again. It has already led to sales resistance. It may lead to replacement of L. P. gas with other forms of fuel in some installations. And cold customers are cold voters. We do not want them clamoring for the Great White Father to keep them warm by government edict. And it could happen. President Eisenhower kept the way open for possible government control of the LPG industry when he vetoed the Harris bill.

> Government control of the gas industries could become the first move in nationalizing the petroleum industry -- and there is a strong left-wing contingent that would like to bring that to pass. We face a situation considerably greater in its implications than just a problem of seasonal supply. The urgent and immediate need is to get this business organized on a basis that will remove any possible excuse for an appeal to the Higher Authority in Washington.

This is not a simple problem. It involves storage, balanced seasonal use, and expansion of production facilities to keep ahead of increasing demand.

> The storage situation is improving at both ends and in the middle. Large-scale underground storage appears to be approaching adequacy at the production end and in the Midcontinent. More is needed in other major production areas and adjacent to many of the major markets. Difficulties of constructing storage caverns in many areas where they are now needed indicate the present necessity of providing the only practical substitutes -- enlarged capacity of average consumer and distributor storage facilities.

These storage facilities cost money, no matter where they are built. They add to the cost of the product without adding to its value. The alternative is to enlarge both production facilities and transport fleet, but this is likewise expensive. The cost of such equipment becomes a fixed part of the year's production. Depreciation and deterioration go on whether equipment is in use or idle. Any way we work it, as long as the seasonal unbalance exists, the cost of the product is correspondingly high. The costs of reserve storage, and of seasonally idle production and transportation equipment, are actually the costs of unbalanced consumption.

Continued

beyond the mains

There is a limit to what can be done in increasing production and transportation facilities during the winter peak without increasing the price of the product to the dealer. But a sizeable gain can be made in output during the slack months, with no increase to the dealer and a desirable increase in profit to the producer. It makes no difference to the producer whether his increased summer production goes into tanks in the customers' back yards, or into increased summer consumption. In either case, present production facilities can be used more efficiently and profitably, and this opens the way to increased production facilities without a heavy price penalty on the additional product. But let's face it -- tomorrow's new production plants will cost more than those of the past, and they will not pay off without year-round utilization.

All of which brings us back to the fact that our industry needs a big increase in summer consumption to permit expansion of the winter heating load. Tractor carburetion, irrigation engines, weed burning and crop drying offer the greatest opportunities to increase summer consumption. The quick development of any of these uses is a big problem of education and promotion. It is not a dealer-size job. It is industry-size. It must operate over a large area, and for a considerable period.

As long as we can see four million tractors operating on gasoline, weeds costing our farmers $5 billion annually, and millions of tons of crops spoiling or deteriorating in the natural drying processes, we can consider that there is a wide-open opportunity to develop a summer demand for L. P. gas. The farmers are looking for just this kind of help. Their income is down, and the only ways that it can be raised are to cut the cost of production and to get increased revenue from their products, either by producing more or by upgrading quality. When they see an opportunity to make extra profits, most farmers can purchase new equipment. They will be quick to install storage to meet their winter needs if they are shown that it is also needed in connection with their summer business of farming.

Not every dealer will be able to balance his winter-summer ratio through an agricultural program, because they do not serve areas where this is possible. But it will not matter if predominantly agricultural areas build up a balancing summer demand. With balanced seasonal production and capacity enough to meet year-round demand, it will not matter to the producer whether his output goes to one locality or another, so long as it goes. But allowing the present industry imbalance to continue is the surest way to end up with dissatisfied and cold customers. We cannot take that risk. There are bureaucrats on every hand looking for cold voters who will help them to take over our basic industries. Our best defense is the balanced load.

Earl Abell

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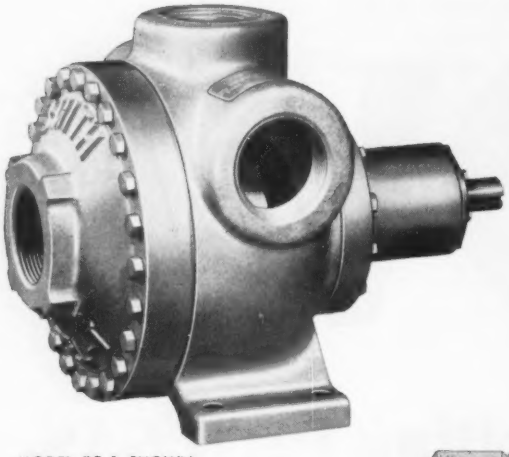

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Thermostatic controls for top burners, automatic ignition, greater variety of burner arrangements and double ovens all add up to the fact that 1956 ranges are easier to use. The roast guide (above) plugs into the meat and registers when the meat has reached the rare, medium or well-done stage on the back splash.

1956 RANGES ARE EASIER TO USE

COOKING with gas, an accepted fact of life for a number of years—in fact, an American idiom—has been given new meaning this year by a new development that can make an expert cook out of even a novice.

Many 1956 gas ranges feature a "thermostatic top burner control" that is said to take most of the guessing out of cooking. It was introduced experimentally last year in connection with the griddle only but proved so popular that it has now been adapted for use with the top burner.

As explained by Wendell Davis, chairman of the domestice gas range division of the Gas Appliance Manufacturers Association, the device consists of a sensing element that measures the heat of the food in the cooking utensil and automatically adjusts the heat output of the top burner to maintain the preselected temperature constantly, never varying more than 2°.

He said this means that for the first time the housewife can select the exact temperature she wants—anywhere between 150 to 400°—and not have to worry about undercooking the food. The importance of this control's now being available "topside" is underlined by the fact that many home economists say that more than 80% of all cooking is done on the top burners.

Most manufacturers are offering the thermostatic control on one or two of their top burners, but there are some variations available. One, for example, offers this new control with a built-in griddle so that the griddle never overheats no matter how many pancakes, hamburgers or other fast-cooking items are cooked or no matter how long the griddle is used. Two other manufacturers, while using the control with their griddle, also offer a converter grid

Engineers too have put their heads together to give the housewife a "self-sealing" oven door resulting in cooler kitchens.

that can convert the control into an extra-large thermostatically controlled top burner.

Built-in ranges are going to get an even larger share of the market this year, Davis predicted, with 19 GAMA members now making this type of units. More models are available than ever before. To give an idea, one manufacturer who last year offered only one model now has top burner units in 24-, 30-, 36- and 42-in. sizes as well as seven different models of wall ovens.

This variety makes for flexibility in installation and the buyer can purchase two burners, four burners or one unit that has four burners with a thermostatically controlled griddle in the middle than can be converted into still another burner. Or, if preferred, the griddle is available with only two burners.

Arrangements are up to the individual; he may want four burners in a line across the back, or two units of two burners each paralleling each other or he might prefer the inverted-V arrangement.

The separate ovens can be bought with or without glass view windows in the oven door; some come with rotisseries in the broiling sections and almost all of them have oven clock controls which give "set-it-forget-it" freedom for other chores.

Color in the gas range is also finally coming into its own. It isn't that every manufacturer is offering colored ranges, Davis said, though most of them have several such models, but that there are more shades available. One manufacturer, for example, offers a choice of black, blue, pink, green, yellow, coppertone, brushed chrome (for built-in units only) and bright chrome.

Another offers green, yellow, coral, desert sand and buff, copper, red, black, white and satin chrome. These are indicative of the much wider range of hues available, with pink and green seemingly the most popular.

But Davis points out that there's one big important difference between color in the ranges this year as opposed to the color that has been available in the past.

The big trouble with color has been that the, say, pink of one manufacturer would not be the same shade of pink as that offered by another. And the two pinks by the range makers would be quite different from the shade of pink that cabinet makers use.

Now many of the appliance makers, equipment manufacturers and cabinet makers have got together and are offering standard shades so that if the housewife wants to buy a green range she knows it will go with a green sink that she may be planning to buy elsewhere or later.

Two growing trends can be seen in this year's ranges, according to Davis. He said that manufacturers are making more 30-in. models than ever before even though the 36-in. range still remains the most popular size. Typical of this trend is one manufacturer who had only two 30-in. models on the market last year and now has five.

Davis said that with bigger families coming into style there has been a demand for more oven space so more food can be cooked at the same time. The engineers have come up with the answer to this without changing the size of the range by more efficiently using the space.

For that reason you can find 36-in. ranges with ovens that are 20 in. in size; several offer a combined broiler and oven 24 in. wide in a 30-in. model while one manufacturer offers a tremendous 26-in. oven in a 36-in. range.

Another arrangement that has grown in popularity is the double oven. This allows the housewife to cook or bake at the same time two separate items that require different temperatures. The double oven is available on a number of different models.

Not only the designers but the engineers as well have taken another look at the oven. It has resulted this year in a "self-sealing" type of oven door which cuts down heat leakage and prevents high temperatures on the outside surface of the door. This, in turn, contributes to a cooler kitchen.

Automatic ignition of all top burners as well as the oven is becoming the standard rather than exception with the great majority of ranges offering variations of the mini-pilot which uses much less gas than the old-fashioned pilot light and guarantees a cool kitchen.

Also on a far greater number of ranges this year are the center-simmer type burners where you have the choice of a simmer position, an intermediate, a high speed flame and even a low, keep-warm position.

The tricky problem of knowing when the meat has been cooked to just the right degree has been solved on several ranges by special measuring controls. On one, a pencil-like heat measuring instrument which is plunged into the meat and registers on the back-splash to show when the cooking meat has reached the rare, medium or well-done stage.

Still another range has a meat thermometer built into the end of its rotisserie spit in its combination broiler and barbecuer. It also pierces the meat and gives accurate readings of the temperature inside, while it is cooking.

Speaking of rotisseries, they're becoming available on a number of different models as the automatic gas range steadily becomes more and more such a complete appliance that it is eliminating the need for many smaller appliances in the home. One manufacturer this year is offering not one but three rotisseries that automatically turn when the broiler door is closed. A selector switch allows the use of one, two or all three of the skewers as desired.

Ease of cleaning is something else that hasn't been overlooked. One model has a drop tray whose camouflaged knob on front of the range resembles another burner control. The tray itself, which drains the grease from the griddle, looks like a king-size automobile ash tray and can be pulled out and emptied in a second. Another range has easily pulled out drip trays that are inserted through the top frame of the oven and are concealed when the oven door is closed. Still another has aluminum inserts underneath the burner that can be thrown away and replaced when badly stained. Several other manufacturers offer models in which the cooking top lifts up or off in one section, making it easier to clean the burner compartment.

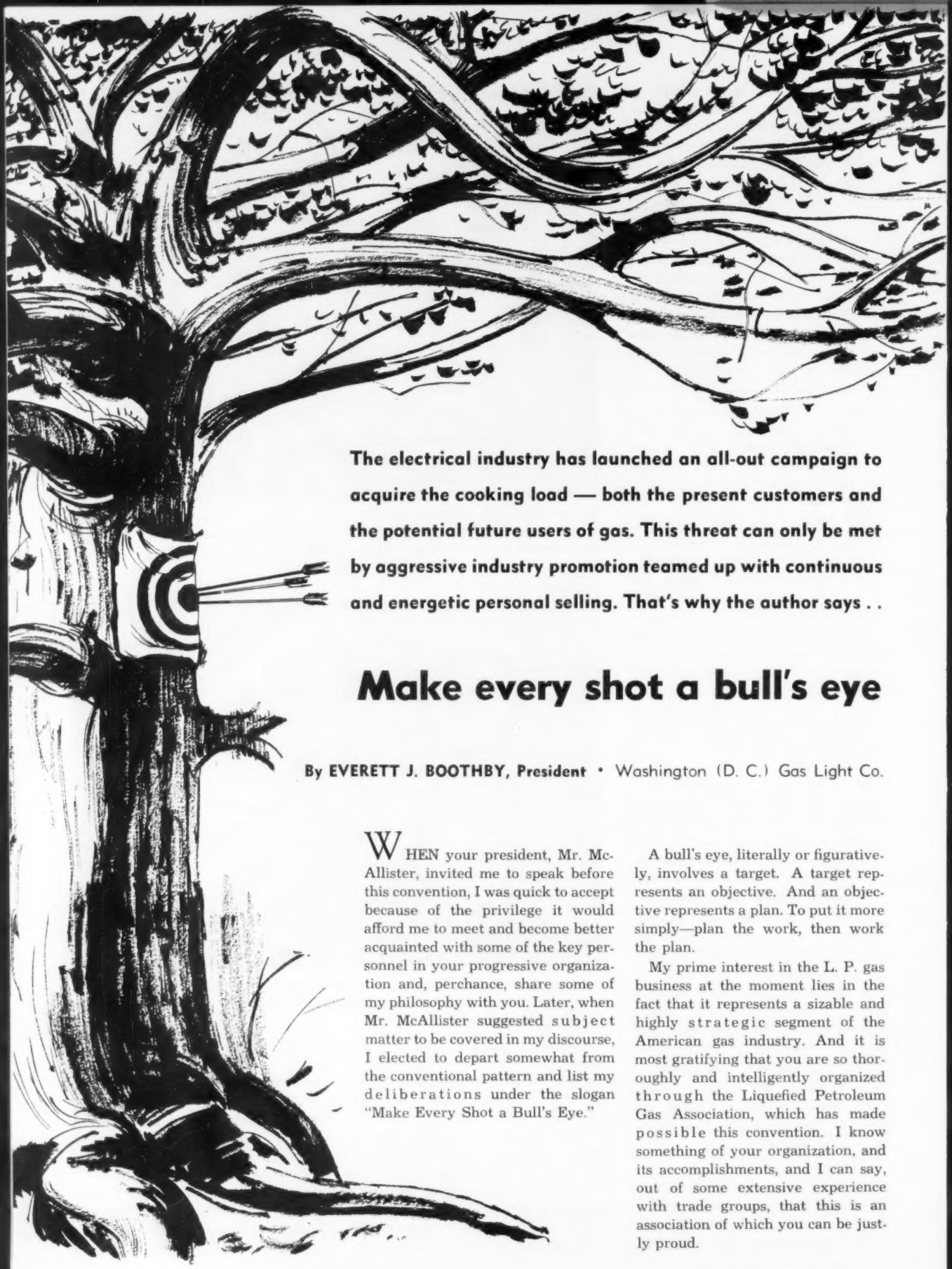
One range has lift-off type oven doors that makes cleaning the oven interior that much easier through greater accessibility, while still another manufacturer has made the glass in his oven door removable so all food and grease splatterings can be rinsed away.

More prevalent than ever are oven lights that go on to show that the oven has been lit. Others light up when the oven has reached the proper degree of temperature and some models combine the two features.

Of interest to women with small children are those ranges that have safety controls that must be depressed before they can be turned on so that there is less danger of the small fry accidentally turning on the gas. Other makes have controls on the top burner section rather than on the front of the range, making them free from inquisitive small hands. ■

An even larger share of the market is seen for built-in ranges, according to Wendell Davis, chairman of the GAMA domestic gas range division. Nineteen GAMA members are now making these units and a wider variety of models are available for 1956.

Wider use of center simmer type burners is teamed with automatic ignition of all top burners and new gas-saving pilot lights in this year's ranges. New drip trays, including some of disposable aluminum, provide real ease of cleaning.



The electrical industry has launched an all-out campaign to acquire the cooking load — both the present customers and the potential future users of gas. This threat can only be met by aggressive industry promotion teamed up with continuous and energetic personal selling. That's why the author says . .

Make every shot a bull's eye

By **EVERETT J. BOOTHBY, President** • Washington (D. C.) Gas Light Co.

WHEN your president, Mr. McAllister, invited me to speak before this convention, I was quick to accept because of the privilege it would afford me to meet and become better acquainted with some of the key personnel in your progressive organization and, perchance, share some of my philosophy with you. Later, when Mr. McAllister suggested subject matter to be covered in my discourse, I elected to depart somewhat from the conventional pattern and list my deliberations under the slogan "Make Every Shot a Bull's Eye."

A bull's eye, literally or figuratively, involves a target. A target represents an objective. And an objective represents a plan. To put it more simply—plan the work, then work the plan.

My prime interest in the L. P. gas business at the moment lies in the fact that it represents a sizable and highly strategic segment of the American gas industry. And it is most gratifying that you are so thoroughly and intelligently organized through the Liquefied Petroleum Gas Association, which has made possible this convention. I know something of your organization, and its accomplishments, and I can say, out of some extensive experience with trade groups, that this is an association of which you can be justly proud.

I am expressing my interest in your well organized industry not just as one gasman to another, but as spokesman of the American Gas Association, which has appointed me chairman of a committee to work with you in determining what might be done to help unify the efforts of both the gas utilities and the gas operators in our common cause.

And I use the term "common cause" advisedly. Never was there a time when it was so imperative for every element in the gas industry to solidly join forces and develop a plan to meet threats of our common business adversary. Your association presents a ready instrumentality for developing such an integrated program.

Perhaps we have been remiss in not earlier giving concrete expression to the community of interest existing between the gas utility and the L. P. gas operator groups. But elsewhere in the over-all gas industry it might likewise be said that unification has been somewhat slow of attainment. But over the years the major cleavages have mostly disappeared.

Not only does the utmost unity exist within the organized gas utilities. It goes much further, to embrace other branches of the gas industry. True, we have had the recent spirited conflict between natural gas distributors, such as my own company, and natural gas producers relative to government rate controls. And we continuously have differences of opinion between distributors and pipeliners. Nevertheless, there exists among us large areas of agreement and cooperative effort. This is exemplified in an extensive promotional program recently launched by the Independent Natural Gas Association of America, to improve public relations of the gas industry as a whole. It provided consumer advertising designed to increase the demand for gas service and point up the team work existing between producer, pipeliner and distributor, in the public interest.

Most telling has been the impact created by the Gas Appliance Manufacturers Association in its continuous campagin of advertising and promotion. This is an organization which gas utilities and L. P. gas operators alike must regard as their staunch ally. The extensive programs of GAMA are closely coordinated with those of AGA.

Recently another group with a vital stake in the gas business has come to the fore—those manufacturers who supply distribution, transmission and production equipment to the industry. This group, under direction of the equipment advisory committee of GAMA, spent more than $100,000 in 1955 for consumer advertising in magazines such as the *Saturday Evening Post*. Larger appropriations have been planned for 1956. Such advertising feautres "Gas for the Seven Big Jobs" and is designed to supplement and expand other industry promotional activity.

But, of course, all the promotional efforts so far referred to are auxiliary to AGA's own giant program, under its permanent coordinated PAR project, which means promotion, advertising, and research. It represents an outlay of approximately $2.5 million a year.

Well over a million dollars of this has gone into research. The superior appliances now available to you, including the new ranges with set-it-and-forget-it top burners, reflect the great advances developed through AGA-sponsored basic research, supplemented by manufacturers' own application research.

Most of the remaining funds in this PAR account, subscribed by the utilities on a meter basis, goes into extensive national advertising which gives full impact to the industry's theme that gas is the modern fuel for modern Americans.

Twelve PAR campaigns are set for the coming year on a basis that will give all gas companies, including those beyond the mains, full opportunity to tie in at the local level. These are: gas laundry promotion, spring range promotion, refrigeration promotion, Old Stove Round-Up, holiday promotion, househeating promotion, incineration promotion, Mrs. America promotion, and commercial water heating promotion.

I can confidently say that our national gas industry, through the vehicle of the American Gas Association, is now doing a highly creditable job. But it has not been by chance —and this is one of the principal thoughts I want to leave with you— it has not been by chance that its present high level of successful performances has been achieved.

In an industry, as in any human endeavor, it requires thorough planning, careful appraisal of the objective, and accurate sighting-in to to *make every shot a bull's-eye*. Under recent conditions of growing competition, the gas industry has found that it cannot afford to settle for anything less.

We think we are on the right track as we begin the fourth year of a thoughtfully conceived Gas Industry Development Program. This has been the outgrowth of steps taken by our industry leaders a few years ago, when our more critical observers began to express uneasiness for the future. A recommended set of proposals was approved by the boards of AGA and GAMA. An Action Program provided 15 basic proposals and several collateral recommendations, each covering a specific area in which gas utility companies were urged to take action. Similar proposals were urged upon the appliance manufacturers.

The broad objectives were (1) A rapid and marked upgrading of domestic and commercial gas appliances in order to meet and overcome the challenge of greatly improved competitive appliances. (2) A substantial increase in the level of promotional activities and expenditures by gas utility companies and appliance manufacturers alike. (3) A reorientation of promotional emphasis by gas utility companies toward higher quality domestic and commercial appliances. (4) Improved installation and service policies to insure customer satisfaction with gas appliances. (5) A greater degree of continuing cooperation on the part of the various trade associations representing the industry, as well as individual utility companies and appliance manufacturers.

In 10 demonstration cities there is currently being conducted working models of the Program for Action by Gas Companies under the industry-wide development committee.

Time does not permit me to even enumerate other functions of the AGA, apart from those mentioned, many of which are of potential value to the LPG operator group. I am desirous that some way be found for you to tap such resources also.

"The electric industry has once and for all thrown down the gauntlet," declared Everett Boothby. "The gas industry is challenged in an all-out contest this year that has never been equalled in all merchandising history."

Of course, we in the utility field are not unmindful of the great contribution made by the L. P. gas group to the welfare of the entire gas industry —particularly its aid in meeting competition by offering your gas service where no other is available, thus helping to keep our ever-shifting population sold on the merits of gas fuel.

Through your national organization and its regional branches, you have already blazed the trail for valuable inter-industry collaboration, notably in the field of collective advertising. A conspicuously successful joint effort is the Unified Highway Sign Promotion, which is gaining such popularity in Pennsylvania, Wisconsin, Illinois, Arkansas, Iowa, and notably throughout the entire state of Oklahoma. Even more promising, on the basis of its broader implications, are such projects as that of Merrimac Valley Gas Institute, recently launched at Lowell, Mass., under the sponsorship of the LP Gas Association of New England.

Other instances of local effort are to be found in the Milwaukee area and the greater Miami area, where a Gas Institute has been in existence for the past five years. Indications are that they have succeeded in reversing the trend twoard electric appliances, especially in new home construction, in this section of Florida.

At the national level, your association is leading the way toward unification of industry-wide promotional activity through its Joint Natural Gas and LPG Council for Unity Committee.

GAMA has also adopted a similar resolution by which it agrees to appoint a committee of three to work with similar committees of LPGA and other interested organizations in developing a cooperative national advertising and sales promotion program administered and supported by all segments of the gas industry.

I have already mentioned the recent action of the AGA in appointing the committee, of which I am chairman, to thoroughly explore the subject and make suitable recommendations.

I am as aware as you are of one of the major problems confronting the dealers in this industry. To phrase it very bluntly, it's "What shall we do with the electric competition we meet, particularly where a combination company is involved."

I have no magic formula nor do I know of any forthright solution. I am sure that you are aware that each utility is as concerned with earnings and dividends as dealers in the industry are concerned with profits.

By facing the problem hopefully and objectively, I am positive that better understanding and, perhaps, in some instances wholehearted cooperation can be effected. It will not be an easy hurdle.

In the meantime, those of us solely in the gas end of the business must use each and every resource at our command to make our products and our services more desirable.

Collectively we are engaged in a multibillion dollar industry. Year after year, records of consumer sales have been broken. Ahead lies the opportunity for continued steady growth and prosperity in which all gas companies—utilities and L. P. gas operators alike—can share.

But we can no longer assume that today's expanding American market will automatically yield to gas its full share of the potential. Surveys point out that a continuing prosperous future is not ours merely for the taking. It is clearly indicated, for example, that left to the mercy of our competitors' propaganda many of our *present* cooking customers would be lost—to say nothing of the potential ones of the future.

I am sure we are all aware of the progress the electric appliance industry has made in recent years, notably its inroads on our cooking load. This has largely been the result of a ceaseless campaign of the competing industry to discredit gas and gas appliances in the consumers' minds. But what has been done in the past along that line bears little resemblance to what we are facing today.

The electric industry has once and for all thrown down the gauntlet. The gas industry is challenged in an all-out contest this year that has never been equalled in all merchandising history. Their opening gun is fired in the January issue of *Electrical World* in an announcement of a "Live Better Electrically" theme for what is cited as "the greatest residential home building drive the electric industry has ever known." You may be sure that much of the fire of this campaign will be centered on the domestic range market.

Individual manufacturers are on the firing line with greatly strengthened offensives — more millions appropriated for bolder and more untenable claims to superiority. A classic example is the hotly—and properly —contested theme of one of them— "20% faster than gas." Most of us, I am sure, know too about the recent developments in the so-called "radar" range program.

We need not be dismayed by what our competitors offer in the way of equipment, either present or projected. We have an appliance product, for the supremacy of which we need have no misgivings; and there are future developments immediately ahead that are nothing short of revolutionary. But, does the public know these things? It is our big job to *tell* them —and then *sell* them!

Through a coordinated effort of the utility industry and the L. P. industry, gas can more than hold its own—it can continue to forge ahead at even an increased tempo, but it will call for masterful planning and execution — "Making Every Shot a Bull's-Eye." ■

Condensed from a talk delivered before the convention of the Northeastern District, LPGA, Washington, Feb. 28. Mr. Boothby is a former president of the American Gas Association.

Looking over one of the full-page group cooperative ads of the "grass roots" advertising program conceived by the Gas Institute of Greater Miami is C. R. Vetter, institute prexy.

BPN exclusive

Manufacturers aid program of Miami Institute

By EDWARD G. DICKSON

A SUGGESTION voiced by C. R. Vetter, president of the Gas Institute of Greater Miami, who felt the L. P. gas dealers should back up the institute's program with their own advertising, touched off the development of the latest promotional campaign in Miami to sell gas and appliances.

Formed almost six years ago with LPG dealers, utilities and appliance distributors as members, the Gas Institute made its main effort one of group advertising of gas and its advantages as a fuel. Although the budget has been a modest one, Gas Institute members feel the campaign has been a success, making the gas message felt through the banding together of the gas interests to spend advertising funds as a group.

That group program is well established now, and the institute has gone a step farther by sponsoring a campaign which allows dealers, manufacturers and distributors as well to place "impact" advertising to promote their particular services and appliances along with gas in general.

Impetus for this new phase in the Gas Institute program came from the belief of Mr. Vetter, now serving his second term as president of the institute, that individual dealers could—and should—augment the institutes generalized advertising program with individual advertising of their own.

"The institute is composed of most of the gas companies of the area, but even so its funds necessarily are limited," he explained. "If we believe in what the Gas Institute is doing to promote gas, we should be willing to back up this belief by additional advertising on our own—if possible by jointly placed advertising in some medium to give it more weight.

"The institute in its advertising couldn't pick out any particular appliances to promote, as the nature of the organization restricted its advertising to gas in general. The public knew, from this advertising, what gas was and that it could be supplied anywhere, but it didn't know much about the various gas appliances.

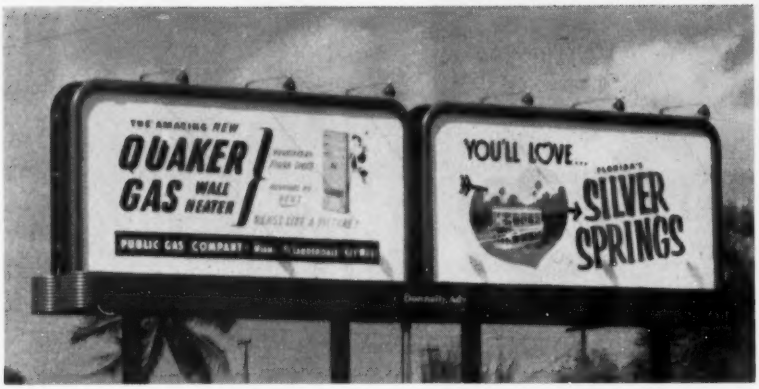
"Eventually we developed our current program, which brings appliances into the advertising picture and which, I believe, has been a big boost to the sales departments of the various institute member companies."

Acting on Mr. Vetter's recommendations, James E. Fussell, executive director of the Gas Institute, worked out an advertising package for sponsorship by the institute. It not only made possible an effective use of individual dealer funds, but took advantage of financial participation by manufacturers and distributors at "a grass roots level."

Known as "Operation Steak Dinner," because it costs a dealer per day about what it would cost for a good steak dinner, this cooperative advertising program spends national and local advertising funds in such a way that individual services and appliances are presented in impact form to go beyond the generalized advertising of the Gas Instiute's continuing program. It includes:

1. Group display ads in the Miami daily newspapers, financed jointly by the dealers and the appliance manufacturers. These have been running at the rate of about 2½ pages a month, either in full-page or half-page size, in either case large enough to attract attention — something individual dealers would find it difficult to do. Dealers take two-column ads in each display, and feature one of their appliances, thus placing the manufacturer's advertising funds at the local level.

2. Billboards. There are 16 of these, contracted for by the Gas Institute, and each one sponsored by a Gas Institute member. Each dealer's billboard is located near his office or plant. These boards, too, feature a particular product that the dealer sells, and are another form of cooperative advertising to bring



Example of one of the 16 signboards (left) which are part of the Gas Institute's "package" cooperative advertising program. This board, paid for as part of its package participation by Public Gas Co., features Quaker Gas wall heater and identifies Public Gas as a dealer. The board is located in the general area of the Public Gas sales office and plant. Ads like this (right) are placed on buses as part of the Gas Institute's "steak dinner" cooperative advertising campaign. Participating institute members buy bus cards as part of the package. Cards are changed monthly, featuring appliances which the dealer wishes to boost.

in national funds to the grass roots level.

3. Bus cards are made up for each participating dealer and are placed on bus routes of his trade area. These, too, feature individual appliances, with the name of the dealer listed as the place to buy them. Like the billboards, the bus cards are changed each month.

Not all members of the institute have joined in this program, which started in 1955, but it is available to all, and about 75% of the Gas Institute member dealers are participating, according to Mr. Fussell.

This package costs each dealer $289 a month, and he, in turn, is able to bill the manufacturers whose advertising he places for half of the cost, or $144.50. There is an additional advantage in this cooperative program, Mr. Fussell said: The advertising dollar has been "stretched" because advertising takes a local rather than a national rate.

Another advantage is that most of the detail work of placing the advertising, the layout, the billing and much of the correspondence concerning the work is lifted from the shoulders of the dealers because the entire program is coordinated by Mr. Fussell.

This steak-dinner program is running around $50,000 a year in advertising placed by individual dealers and manufacturers to supplement the $35,000 promotional program and generalized advertising of the Gas Institute.

"For a long time, we have been trying to interest appliance manufacturers in a program to reach the consumer through individual dealers," said Mr. Fussell. "The best evidence we have of the success of the program is that manufacturers now are anxious to get into it.

"Individual dealers can make a better showing—an impact type of advertising—by going together to do it," he explained. "And in this way, they can advertise appliances as well as the services which go with the appliances, and at the same time obtain the manufacturer's funds to help make the advertising appeal greater."

In making up the ads, Mr. Fussell attempts to include as many representative types of appliances as possible—depending some on the season—to vary the appeal. Also included in each cooperative ad is a strip telling a story like "Gas Services The *Whole* Family" and carrying the Gas Institute's identifying signature cut.

Neither radio nor television advertising has been included in the package but the Gas Institute recently completed arrangements to provide lower-cost spot radio announcement time to members, Mr. Fussell announced.

The Gas Institute has contracted for 1000 spot announcements on two radio stations at a rate which permits dealers to save a third of what they would pay as individual firms. The spots are contracted for a year's period, so that spots are available at almost any time the dealer wants to use them. These, too, can be cooperative advertising, with the dealer plugging a particular appliance and billing the manufacturer for half of the cost. The institute itself plans to use about 300 of the spots during the year, leaving some 700 available for member dealer use.

Although the Gas Institute's group advertising of the gas cause in general is continuing, "we now are pitching on the cooperative dollar as the meat in the cocoanut," Mr. Fussell said.

Advertising remains the chief of the institute's activities. Other promotional efforts include close liaison work with civil defense authorities, the state fire marshal's offiice and zoning authorities. The group has continued its "salesology" meetings—sessions which endeavor to share with management and sales personnel means and techniques of selling gas and gas appliances.

Gas Institute membership has remained at about the same level as in other years. Some firms have dropped out, and others have joined, and the group represents 95% of the industry, according to the institute.

Member firms are: Appliance Warehouse Corp., City Gas Co., Clement Gas & Appliances, County Bottled Gas Co., Dade Gas Corp., Dixie Gas Corp., Dri-Gas Co., Florida Gas Corp., Florida General Supply Co., Florida Power & Light Co. gas division, Florida Radio & Appliance Corp., Gas-Oil Products Inc., Household Gas Co., L. P. G. Equipment Co., Maloney Distributing Co., Miami Bottled Gas Inc., Nor-Gas Corp., Peoples Water & Gas Co., Public Gas Co., South Dade Gas Corp., Southeastern Natural Gas Corp., and Sungas Co. ■

Plumbers furnaces provide hot market for LPG

By **PAUL LADY**
Vice President • Mutual Liquid Gas Equipment Co.

L. P. gas is rapidly becoming standard equipment in plumbers' kits all over America. This is an important market for L. P. gas dealers and can be the source of increased revenue in the sale of both fuel and equipment. There are better than 63,000 plumbing shops in this country today employing well over one-half million journeymen plumbers. These men are participating in the biggest building boom that our country has ever seen. They need tools that are modern, efficient and fast.

For the heating jobs that a plumber must do, LPG is by far the superior fuel. Plumbers are using it for melting lead, soldering streamline copper fittings, and burning lead out of joints. It is also popular for small repair work or for any job where fast, portable heat is required in order to do a good job.

The importance of this market for L. P. gas equipment is realized when one considers the potential for metal melting furnaces. Plumbers who have used LPG equipment for many years estimate that a shop with 10 journeymen will own more than five melting pots. This figure varies with the type of shop.

If a company does mostly repair work and new house construction, every truck must have a lead melting furnace. Shops specializing in tracts and large construction may get by with fewer furnaces per man employed; however, one such firm has more than 40 furnaces in constant use.

There is a similar demand for torches and other L. P. gas equipment. Every truck will require one or more, and many plumbers like to have several torches with different size tips available.

The replacement factor on melting furnaces, torches, hoses and other equipment is great in the plumbing trade. Furnaces and torches get considerable wear from heat and hard usage. The loss factor is also substantial, especially on tract work.

As for fuel sales, the plumber is a good source of constant revenue. Although the purchase of gas will

vary some throughout the year, due to climatic conditions, the LPG dealer can depend on a pretty steady load. Fortunately, the heavy building season in most sections is in the spring and summer when the dealer's load is slack.

An analysis of the sale of gas over a two-year period to a group of typical plumbing companies shows:

1. An average one-man shop uses 500 lb per year.
2. A medium-sized contractor (employing an average of 10 men) will use better than 4000 lb per pear.
3. A large plumbing contractor (employing an average of 50 men) will use as much as 62,000 lb per pear.

L. P. gas has many superior points over gasoline equipment. It is faster. The original heat-up time from a cold start for propane is less than 15 minutes for a 9-in. pot against 35 to 40 minutes for gasoline. (That's if the gasoline pot will light. Half the time it has to be cleaned, adjusted, or repaired before it will generate.)

L. P. gas is cleaner. There is no soot, carbon or smoke. This is important from the standpoint of workmen, as well as the maintenance of equipment. Also the elimination of offensive odors, so prevalent with gasoline furnaces, is not a problem when propane is burned—a significant point when used on repair jobs in the homes of customers.

L. P. gas is safer. The hazard of relighting a warm gasoline furnace is eliminated. With gasoline, the user must wait until the furnace is completely cool before relighting, or face the possibility of an explosion. The hazard of spilled gasoline is eliminated.

Propane is cheaper. Because the combustion of propane is far more efficient than gasoline, the plumber will use less over a period of time. Spillage is also a great loss when gasoline is used.

With LPG downtime for cleaning and repairs is practically eliminated. There is little that can go wrong. With a gasoline unit a great deal of time is wasted in cleaning, adjusting, or repairing.

Lead melting is the big use for propane in the plumbing trade. It is utilized for pouring joints in soil pipe, for the wiping of joints, and for repair work. In the shop, lead is used mainly for the prefabrication of pipe and joints into units that can later be assembled in the finished construction at the job. Much of this work is being done today in the prefab assembly yards located at housing projects in big construction jobs.

While the cylinder-mounted fur-

MELTING LEAD

Whether L. P. gas is used at the shop, in the prefab assembly yard, or on a repair job, it is fast becoming the fuel that plumbers demand. It is popular because there are no fumes or odor from the burning gas. It is unnecessary to pump pressure into the cylinder periodically throughout the day as with gasoline. There is never any messy or hazardous liquid spilled from filling operations. If the LPG cylinder runs out, a new one is attached in minutes and the furnace relighted at once. It is unnecessary to wait until the furnace cools off before relighting and, with propane, there is seldom any downtime for adjustment or repairs.

Base-mounted furnace in use at plumbing assembly yard where prefab units are assembled for large housing project. Base-mounted furnace is attached to long hose so unit can be moved to most convenient position.

A large industrial lead melting furnace is being used at plumbing shop. Attached to 100-lb cylinder, this furnace provides sufficient lead for crew of plumbers. The 12-in. pot holds well over 200 lb of lead.

nace is the most popular for field work because of its portability, the base-mounted unit is usually preferred in the shop. It is light and easy to move around. Connected by a long hose to a large fuel supply—usually a 100-lb cylinder—it can be located at the most convenient spot for several workmen.

Once the furnace is started in the morning, it is seldom turned off. The use of an L. P. gas furnace in a compound where a number of men are working for many hours is an important factor from both a health and work-production standpoint as fumes and odors are less offensive. The constant pressure on the L. P. gas tank eliminates pumping—a big saving in man-hours and high wages.

Soldering copper fittings—sometimes known as streamline copper soldering—is another job that LPG is taking over. Propane is replacing oxy-acetylene, formerly the plumber's standard heat source for this operation. Although L. P. gas is not as hot as acetylene, it has many advantages as far as the plumber is concerned. It is cheaper, easier to use, and handier.

Every plumber who uses L. P. gas for lead melting has his fuel supply for soldering always available. There is no extra cylinder or fuel to worry about. All he needs to do is to remove his melting furnace from the cylinder, hook on a hose and torch, and he's at work. This can be done in a matter of minutes. L. P. gas is, of course, much cheaper than the high-priced acetylene fuel.

Propane is ideal for melting out lead joints in soil pipe. This is one of the most tedious jobs a plumber does. In the past it was either done with hammer and chisel or with the expensive acetylene torch. Now L. P. gas does the job quickly, inexpensively and efficiently.

Here, again, the availability of the fuel is important. The same fuel supply cylinder required for lead melting may be used. It takes only a minute to unhook the melting furnace and hook on a hose. It usually takes 15 to 20 minutes to complete the job, and is much faster and easier than chipping out. Of course, the low cost of propane as compared to acetylene pays off many, many times.

Plumbing with L. P. gas is a big field to be developed, but it is just one of many industrial loads that the dealer should cultivate. Others, such as tinsmiths, garage mechanics, electricians, flooring mechanics, to name but a few, offer great potential to the L. P. gas dealer. ■

Plumber (upper left) pours lead into mold. This is a precision job. There is never any lost time for pumping or repairs when L. P. gas is used. The tank-mounted unit (upper right) is the most practical for field work. Here plumbers are pouring lead for new drain pipe installation. Detachable furnace mounts on cylinder, which may be moved about to most convenient location. Unit shown holds 20 lb, which provides more than 20 hours continuous burning time. From cold start it takes less than 15 minutes to have lead melted and ready to pour. Pouring lead in pipe joint at large housing project (right). Pipe units are put together at prefab yards nearaby. When these are assembled at construction site, units are joined and single uprights added. Often lead for only one or two pours is needed. The L. P. gas furnace is ideal as it may be lighted throughout the day as required—without lost time for pumping, priming, or generating heat.

MELTING OUT OF JOINT

Removing lead from joints by "melting-out" is one of the most difficult of a plumber's jobs. In the past this tedious work was done by chipping out with hammer and chisel, with gasoline blow torch, or with expensive acetylene flame.

Now L. P. gas does the work fast, clean and at low cost. Here again the use of the fuel supply available for lead melting is an important item. And the low cost of propane as compared to acetylene is a factor that pays off many times.

Plumber at prefab yard uses propane torch to melt out joint that must be replaced due to mistake in lineup. It is possible to melt out lead and have joint completely clean in 15 to 20 minutes. No other method is as fast or as inexpensive.

Plumber melts out joint in soil pipe that has to be realigned. Furnace has been removed from cylinder temporarily for this job. Switch from furnace to torch takes only minutes to accomplish.

Hand torch is being used to melt out joint that proved faulty during inspection. Lead in this hard-to-get-at spot has to be replaced. Propane hand torch is also popular for small repair jobs.

COPPER SWEATING OR SOLDERING

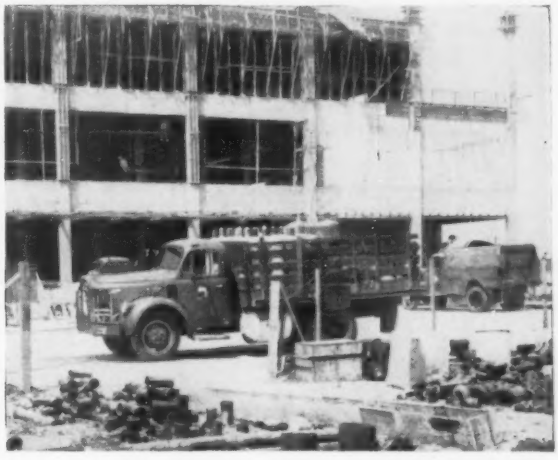
Plumbers have found that LPG will take the place of the expensive and less convenient oxy-acetylene assembly for the soldering of copper pipe. L. P. gas has many advantages over the older method. There is no need for a second fuel supply when propane is used. The same fuel source used for melting of lead furnishes gas for the hand torch used in soldering. L. P. gas is much less expensive to use than acetylene and will last much longer.

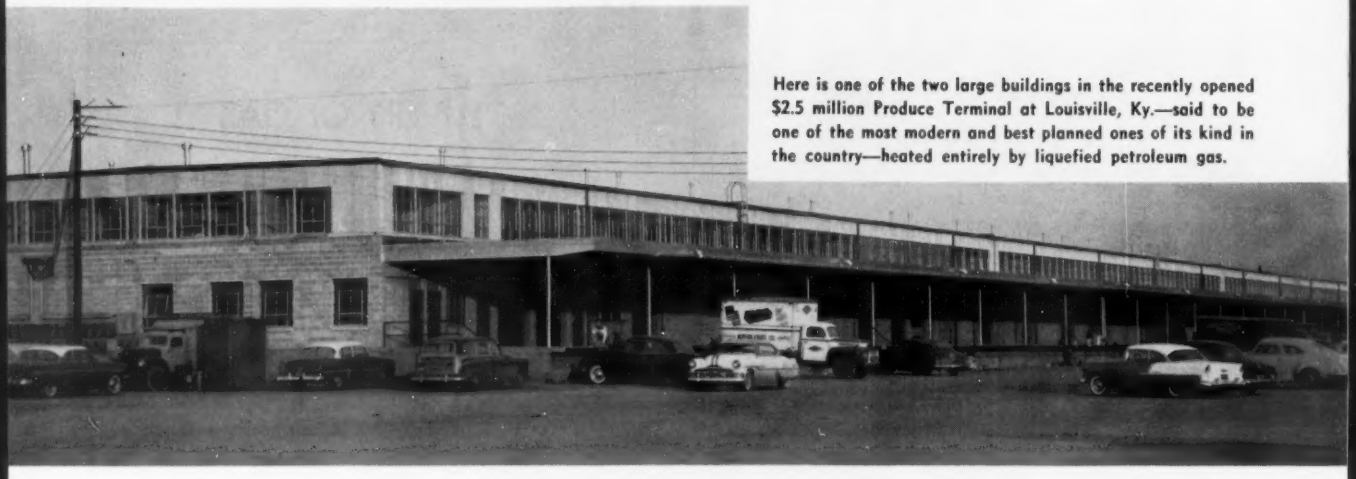
DELIVERY OF GAS

Delivering fuel to the plumber at his shop or at the construction job can be a profitable business for the L. P. gas dealer. This is especially true in the metropolitan areas where many dealers have built substantial loads delivering to plumbers, tinsmiths, garages, etc. The "plumber customer" will use many more gallons of fuel than the average domestic customer who buys L. P. gas in cylinders. And the plumber is a constant source for equipment sales as the trade is rough on tools.

Shown here are photos of propane being used for the sweating in of copper fittings on a large housing project. After the lines are laid, concrete is poured over the pipes to form the floor of the building. The joints must hold. The plumber has removed detachable furnace from cylinder and attached special L. P. gas hose and torch. Thus, it is possible for the plumber's entire kit to consist of cylinder, furnace, hose, and torch.

Driver (above) for Mutual Liquid Gas Co., Gardena, Calif., unloads 11-lb cylinder at plumber's yard from new Reo truck. This truck was recently designed for delivery of L. P. gas to industrial accounts in the Los Angeles metropolitan area. These bodies have proved to be the ideal design for this type of work. Mutual operates four trucks for the delivery of industrial fuel. Delivery of gas (below) at large construction job.





Here is one of the two large buildings in the recently opened $2.5 million Produce Terminal at Louisville, Ky.—said to be one of the most modern and best planned ones of its kind in the country—heated entirely by liquefied petroleum gas.

Louisville produce market water tower heated with L. P. gas

Have you heard of using L. P. gas for fire protection? Louisville's new produce terminal water supply is kept liquid in the coldest weather.

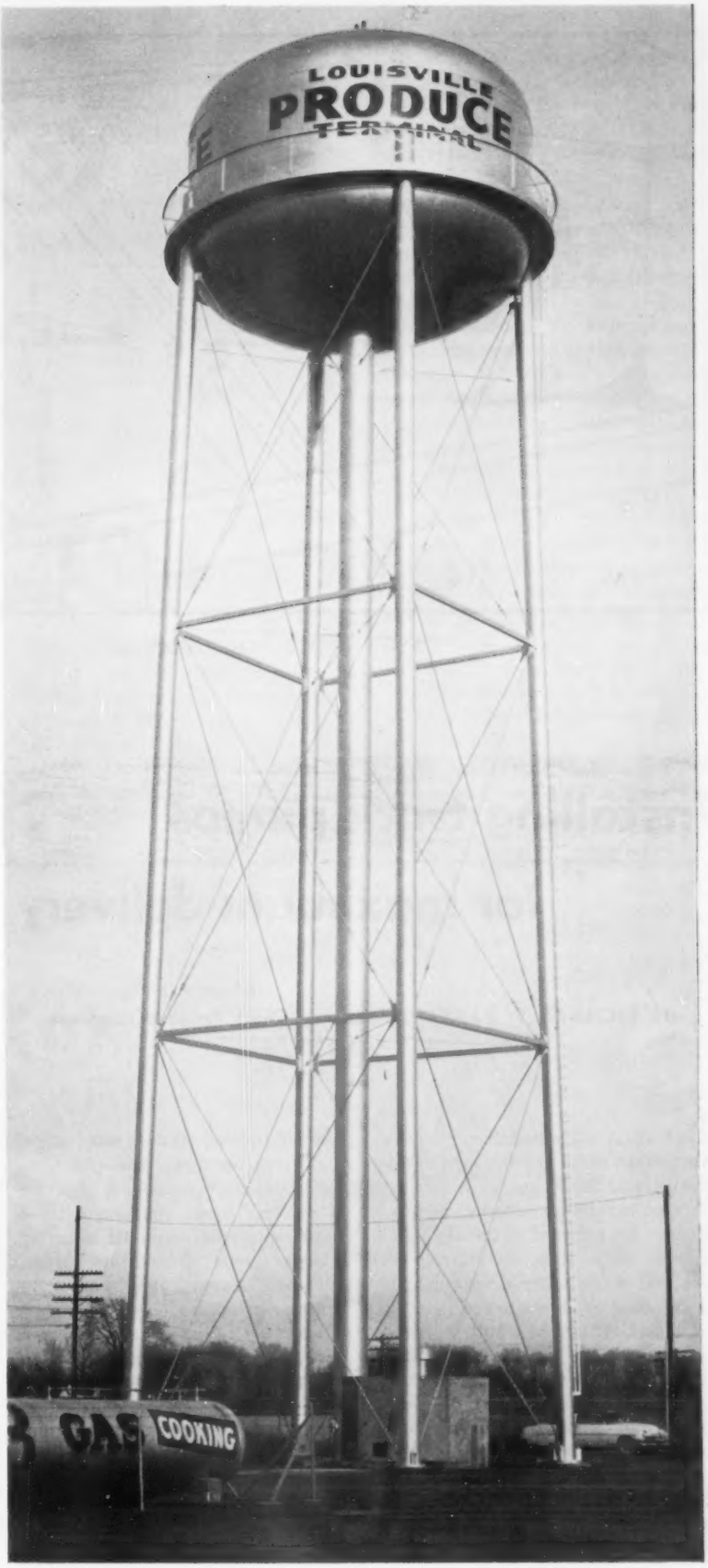
OLD MAN WINTER was especially severe during recent months in his treatment of Louisville, Ky., but the hundreds of persons employed in the city's new $2.5 million produce terminal located in the outskirts of the city didn't mind at all. Once inside they were warm and comfortable and joined produce dealers and the market's operators in lauding the efficiency of L. P. gas.

Every feature of the new terminal is the best that brains and money could devise and those responsible for the planning say the unusually cold waves the city experienced following the opening last December amply justify the selection of L. P. gas for heating and other purposes.

The terminal, which occupies a 20-acre all-paved, all-flood-lighted tract, features two long well-constructed buildings, each of two stories and in which are offices of the produce deal-

To advertise the fact that the Louisville Produce Terminal is gas heated, Irvin F. Etscorn, president of the Bottled Gas Distributing Co., had the two 6000-gal. propane tanks lettered as shown here, to put over the fact that L. P. gas is the ideal fuel.

Fire protection for the new terminal is provided by a 100,000-gal. water storage tower, the water being kept above freezing temperature during the winter months by a 500,000 Btu propane heater.



ers who make up the Terminal Association. There is a large and modern restraunt in each of these buildings and nearby is a large open-sided sales and display shed.

Water tower

Gas, which is used for all of the heating and cooking, also serves to keep above the freezing point the water in a 100,000-gal. fire protection water tower, the heat being furnished by a Bryant 500,000-Btu propane heater. Fifty-four trading units, occupied by individuals or firms, are heated on a metered basis. All gas is supplied from two 6000-gal. propane tanks installed and serviced by the Bottled Gas Distributing Co.

Irvin F. Etscorn, president of the company, which is publicized as the "Big 3" in order to emphasize that gas is ideal for cooking, heating and for industrial uses, says the installation is proving highly satisfactory. Also, he adds, it is creating new interest in the use of gas for large business and industrial buildings.

Propane praised

This interest is not confined to Louisville as the new terminal, one of the most modern in the country, is attracting produce dealers and shippers from distant points and those who show them around and explain its many novel features are loud in their praise of the effectiveness and the economy of propane.

The new terminal, designed to speed up the handling of fruits and vegetables and to deliver them to retailers in fresher and better condition than was possible from the old terminal, was financed entirely by dealers who share in its benefits. U. S. Department of Agriculture and the Kentucky College of Agriculture helped in formulating the plans. Leaders in the industry see the decision to use liquefied petroleum gas in such a modern and carefullty designed plant as new proof of its popularity and general acceptance. ■

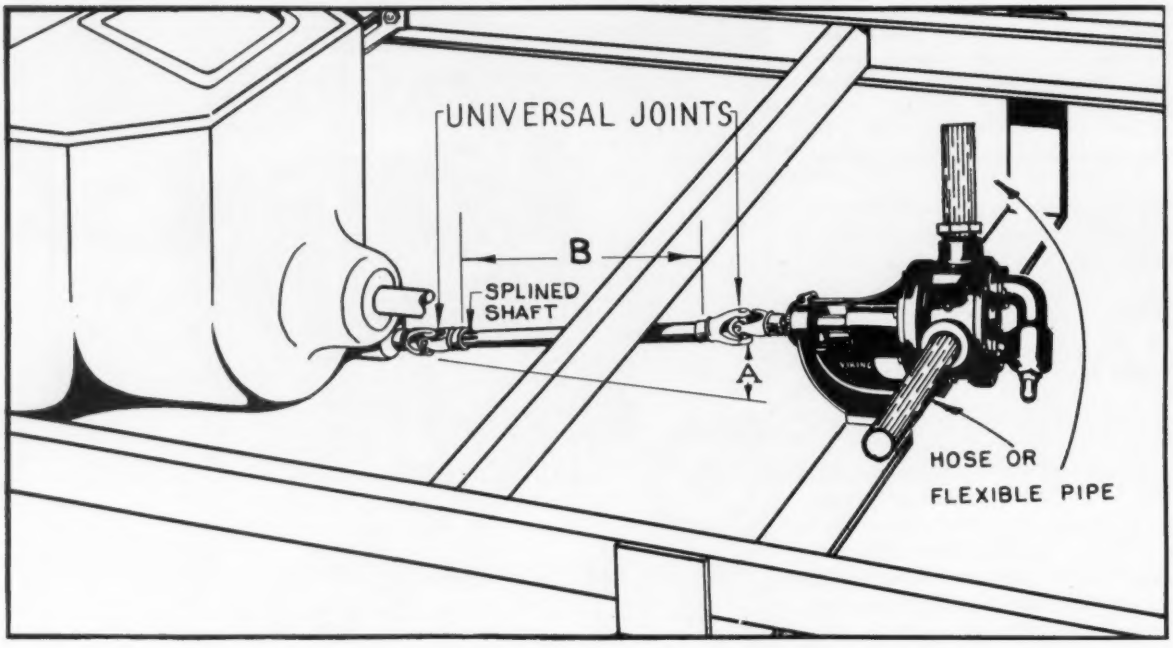


Fig. 1

Installing truck pumps for maximum delivery

By **RICHARD S. PARKER, Assistant Chief Product Engineer**
Viking Pump Co., Cedar Falls, Iowa

NEARLY all bulk delivery trucks being built today are designed to deliver liquid L. P. gas at a rate of 30 gpm maximum. Piping, meters, etc. are not designed to handle higher flow rates. It is, therefore, poor practice to use a truck pump which is designed to handle more than 30 to 35 gpm for use on a bulk delivery truck.

The use of a pump which is too large for the piping will result in vapor formation in the pump inlet, excessive bypassing through the relief valve or bypass valve, and *less* liquid delivered through the end of the delivery hose than if the proper size pump had been used. The two most common causes of slow rates of delivery are improper inlet piping to the pump and too small a diameter of delivery hose. Neither of these troubles will be corrected by using a larger pump. In fact, these conditions will be aggravated by using an oversize pump.

The saddle-type mounting shown in *Fig. 1* is quite commonly used on truck installations. However, the pump may be mounted sideways or upside down, providing the recommended ratio between dimension A and B as illustrated in *Fig. 1* is maintained.

It is important to use a universal joint both next to the power take-off and next to the pump shaft. The power take-off shaft should be rigidly fastened to the universal joint on the pump shaft, but should be connected by a sliding spline to the power take-off universal.

The maximum slope of the power take-off should not exceed 2 in. per foot. If length (B) is 3 ft, dimension A should not exceed 6 in.

The piping connections to the pump ports must be made with hose or flexible pipe. If rigid connections are made, the twisting and springing of the truck body will cause undue strain on the pump.

The pump, and the piping leading to the pump, should be placed as far from the truck exhaust system as possible. If it is necessary to have the exhaust pipe or muffler close to the pump, insulation should be used to reduce to a minimum the amount of heat picked up by the liquid in the pump and piping.

Inlet line

One of the most important principles which must be considered in regard to the pump inlet line is the fact that the L. P. gas in the tanks on the truck will exert a pressure within the tanks equal to its saturated vapor pressure. The saturated vapor pressure of a liquid may be defined as the pressure at which both

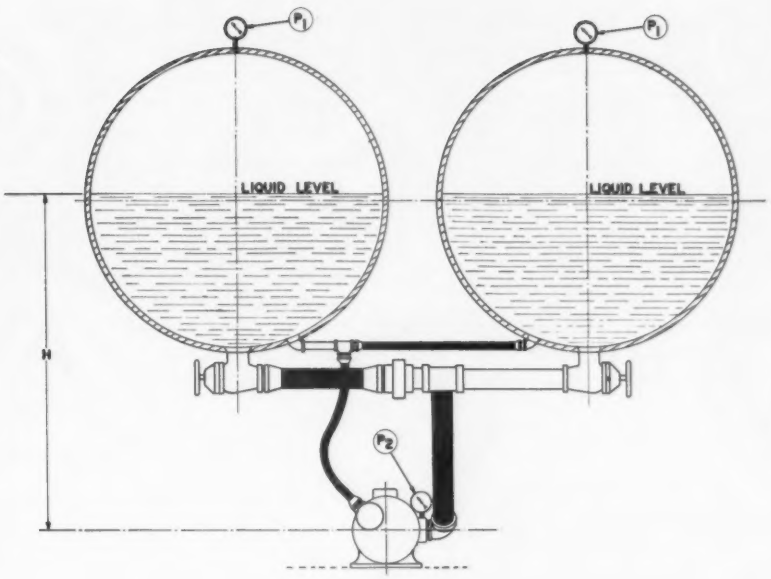


Fig. 2

liquid and vapor exist in equilibrium in the same container. The saturated vapor pressure of propane at 70° F is 124 psia, of butane at 70° F is 31.6. The saturated vapor pressure of water at 212° F (water's boiling point) is, of course, atmospheric pressure (14.7 psia).

In other words, when handling L. P. gas we are handling a liquid which is right at its boiling point. A slight reduction in the pressure being exerted on the liquid will cause boiling and thus vapor formation.

With this information in mind, let us examine *Fig. 2*. The pressure in tanks (P_1) is equal to the saturated vapor pressure of the liquid. When the pump is not running, the pressure at the pump inlet ((P_2) is equal to the tank pressure (P_1) plus the static head (H).

If no liquid is flowing:

$$P_2 = P_1 + H.$$

As soon as the pump is started and liquid begins to flow, the pressure at the pump (P_2) will drop by an amount equal to the pressure loss in the piping between the tank and the pump.

When liquid is flowing:

$$P_2 = P_1 + H\text{—Piping loss.}$$

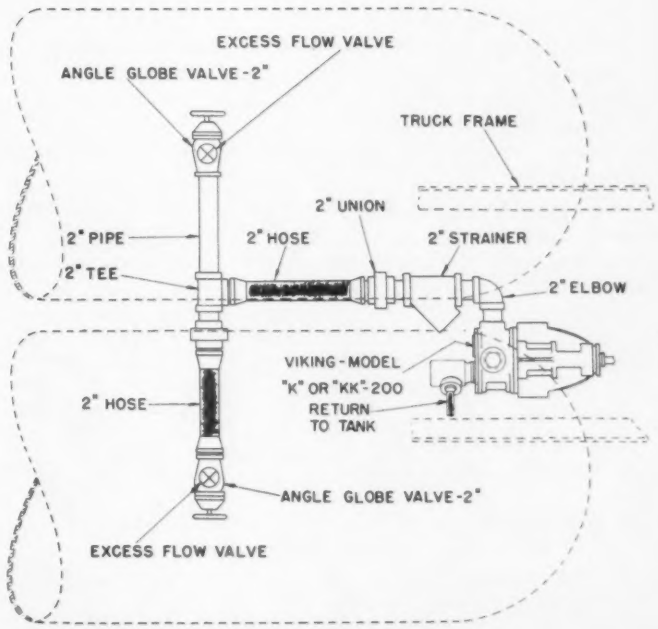
In order to have an ideal pump installation so that the pump will handle all liquid and no vapor, the pressure drop in the piping must be no greater than the static head (H). If the pressure drop in the piping is greater than the static head, the liquid will boil and the pump will be required to handle vapor. Since a given weight of vapor occupies more volume than the same weight of liquid, the liquid output of the pump will be reduced.

Never use less than 2-in. pipe and fittings on the inlet line to a truck pump because it is impossible to mount the pump low enough to produce a static head (H in *Fig. 2*) greater than the piping friction loss in pipe of less than 2-in. size.

The two basic bulk delivery truck designs in common use are the single tank and the twin tank. The trend at the present time is away from the single-tank design in favor of the twin-tank design. The twin-tank design offers a definite advantage when the same product is carried in both tanks, in that the pressure drop in the piping is lower because only one-half the liquid handled by the pump flows through an excess flow valve in each tank. In view of the fact that the pressure drop through the excess flow valve is usually greater than all the rest of the inlet piping, this is an important advantage from the standpoint of good pump operation.

Fig. 3 shows a basic pump inlet line for a twin tank bulk truck. *Fig. 4* shows a basic inlet line for a single tank bulk truck.

The significant points to note on these drawings are: 2-in. pipe and fittings are used throughout; a strain-



BULK TRUCK PUMP INLET LINE FOR TANDEM TANKS

Fig.3

TABLE 1. Approximate Head Loss in Feet of Liquid for Bulk Truck Pump Inlet Lines Similar to Those Shown in *Figs. 3* and *4* for the Four Cases Described. Pressure Drop Values Do Not Include Excess Flow Valve Losses.

Flow rate, gpm	PRESSURE DROP IN FEET OF LIQUID			
	Case #1	Case #2	Case #3	Case #4
20	0.7	0.4	1.1	0.4
30	1.4	0.6	2.3	0.8
40	2.6	1.1	4.2	1.5
50	4.0	1.7	6.6	2.3

er having a 40-mesh screen should always be used to prevent foreign particles from damaging the pump; and no rigid piping is connected to the pump. Always use hose connections between the tanks and next to the pump. Rigid piping will cause twisting and permanent distortion in the pump. Distortion in the pump will cause premature wear.

A bulk delivery truck pump inlet using the proper 2-in. pipe size can be broken down into four basic cases.

These four basic cases will include nearly all bulk trucks that would be considered to have a satisfactory inlet line. As will be shown later, the twin tank arrangement is preferred as far as the pump is concerned.

The four cases are:

Case No. 1. Twin-tank installation, as shown in *Fig. 3* having 2-in. angle globe valves at each tank outlet and a 2-in., 40-mesh screen strainer ahead of the pump.

Case No. 2. Twin-tank installation, as shown in *Fig. 3*, except that the angle valves are replaced with full opening valves (plug, ball, etc.) and the 2-in. 40-mesh screen strainer is replaced with a 2½-in., 40-mesh screen strainer.

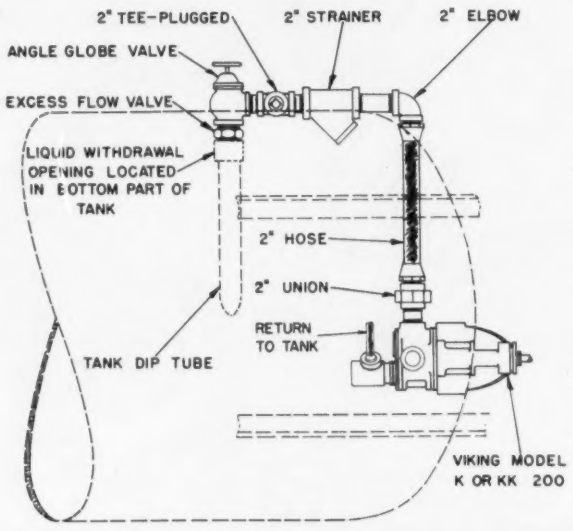
Case No. 3. Single-tank installation as shown in *Fig. 4* having a 2-in. angle globe or straight globe valve at the tank outlet and a 2-in. 40-mesh screen strainer.

Case No. 4. Single-tank installation, as shown in *Fig. 4*, except that the globe valve is replaced by a full-opening type valve (plug, ball, etc.) and the 2-in., 40-mesh screen strainer is replaced by a 2½in., 40-mesh strainer.

Table 1 shows the approximate head loss in feet of liquid for each of the four cases at various rates of flow through the inlet line from the excess flow valve (but not including the excess flow valve) to the inlet port.

The total pressure drop in the pump inlet line between the tank and the pump will always be equal to the drop in the piping as obtained from *Table 1*, plus the pressure drop across the excess flow valve (or valves) as obtained from *Table 2*.

Example No. 1: Assume that we have a single tank bulk truck with the piping designed as shown in *Fig. 4*. The excess flow valve is a 2-in. by 1¼-in. and we wish to deliver liquid butane at the rate of 30 gal. per minute. *Table 1, Case No. 3* tells us that the line loss will be 2.3 ft of liquid. *Table 2* tells us that the excess flow valve loss will be 4.1 ft.



BULK TRUCK PUMP INLET LINE FOR SINGLE TANK INSTALLATION

Fig. 4

TABLE 2. EXCESS FLOW VALVE PRESSURE DROP CHART

Excess Flow Valves Used in Pump Inlet Lines Should Have a Closing Flow Rating of at Least Twice and Preferably Three Times the Normal Expected Pumping Rate. Excess Flow Valves Used in Pump Discharge Lines Should Have a Closing Flow Rating of at Least One and One-half Times and Preferably Twice the Normal Expected Pumping Rate. Excess Flow Valve Closing Rating Should Be Less Than the Maximum Flow Rating of the Piping Down Stream from the Valve.

Pressure Drop Figures Given Below Are Average Values for the Sizes Given. Values Will Vary Slightly Between Valves Manufactured by Different Companies, But Values Given Are Quite Satisfactory for Most Calculations on LP-Gas or Anhydrous Ammonia Installations.

Flow Rate GPM	PRESSURE DROP THROUGH VALVE IN FEET OF LIQUID				
	Male Thread: 1¼-in. Female Thread: 1¼-in. Rated*: 20-35	Male Thread: 2-in. Female Thread: 1¼-in. Rated*: 35-50	Male Thread: 2-in. Female Thread: 2-in. Rated*: 60-90	Male Thread: 2½-in. Female Thread: 1½-in. Rated*: 60-90	Male Thread: 3-in. Female Thread: 2-in. Rated*: 90-120
10	2.2	0.6	0.4	0.3	—
15	4.4	1.2	0.9	0.7	0.4
20	7.2	2.0	1.4	1.1	0.7
25	10.2	2.8	2.0	1.6	1.0
30	14.5	4.1	2.8	2.3	1.5
35	—	5.9	3.5	2.8	1.8
40	—	6.6	4.8	3.8	2.4
45	—	—	5.5	4.4	2.8
50	—	—	6.9	5.5	3.5

*Range of Rated Closing Flows for Valves Made in This Pipe Size in Gallons Per Minute.

Line Loss	2.3 ft
Excess flow valve loss	4.1 ft
Total inlet line loss	6.4 ft

Example No. 2: Assume that we have a twin tank bulk truck with the piping designed as shown in *Fig. 3*, except that ball valves are used in place of the angle valves and a 2½-in. strainer is used. A 2-in. by 2-in. excess flow valve is used in each tank and we wish to deliver liquid butane at the rate of 30 gpm. *Table 1, Case No. 2* tells us that the line loss will be 0.6 ft. Since we have two excess flow valves, one in each tank, 15 gpm will flow through each. The pressure drop for 15 gpm through a 2-in. by 2-in. excess flow valve from *Table 2* is 0.9 ft.

Line loss	0.6 ft
Excess flow valve loss	0.9 ft
Total inlet line loss	1.5 ft

The truck in Example No. 1 has over four times the pressure drop in its inlet line as does the truck in Example No. 2. Considerable vapor would form in the inlet line of the pump in the first example since boiling will occur at the pump any time the height of the liquid is less than 6.4 ft above the pump, which on most trucks will be true even when the tank is 90% full. The inlet loss will affect the pump capacity as shown in *Table 1*. For example, assume the tank is about empty and the liquid butane level is only 2 ft above the pump inlet, the pump capacity would be reduced from 30 gpm to 18 gpm when the temperature is 70° F, from 30 gpm to 23 gpm at 100° F, and from 30 gpm to 10.5 gpm at 40° F. As can be seen from *Table 3*, the capacity drop will be considerably less for both propane and ammonia at the same temperature, since at the same temperature the vapor pressure will be greater and thus the vapor will occupy less volume.

The truck in Example No. 2, which has only a 1.5-ft pressure drop, will have vapor-free liquid delivered to its pump at all times since on nearly all trucks the liquid level wlil be 1½ ft or more above the pump. Based on our assumed value of 30 gpm, we would expect the pump on this truck to deliver at this rate regardless of the temperature, since there would be no vapor formation in inlet line.

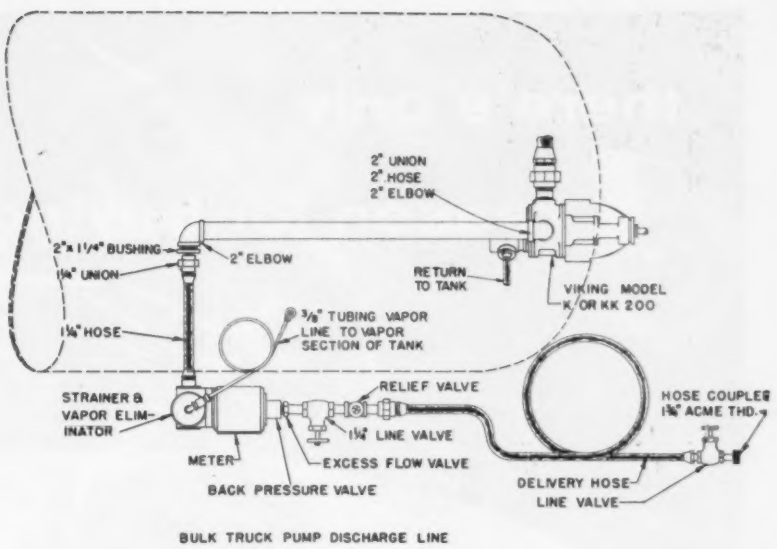


Fig. 5

The high pressure drop in Example No. 1 could be corrected by using a larger excess flow valve in the tank. A much better condition could have been achieved if either a 2-in. by 2-in. or a 2½-in. by 1½-in. excess flow valve had been used in place of the 2-in. by 1¼-in. valve. It is very important to have a properly designed pump inlet delivering liquid.

Summarizing: A properly designed pump inlet line will result in the following advantages:

1. Eliminate the possibility of distortion and mis-alignment in the pump.
2. Result in pumping rates which are equal to the capabilities of the pump.
3. Prevent the fluctuation of pumping rates with temperature.
4. Longer pump life.

TABLE 3. CAPACITY LOSSES DUE TO IMPROPER PUMP INLET LINE

PERCENT RATED PUMP CAPACITY AS GIVEN IN CURVE 1 WHEN THE PUMP INLET LINE FRICTION LOSS IN FEET OF LIQUID IS GREATER THAN THE ACTUAL HEIGHT OF THE LIQUID ABOVE THE PUMP.

Liquid and Temperature	DIFFERENCE BETWEEN INLET LINE FRICTION LOSS AND HEIGHT OF LIQUID ABOVE PUMP IN FEET									
	1	2	3	4	5	6	7	8	9	10
Propane 100° F.	99.0	98.5	98.0	97.5	96.5	96.0	95.0	94.5	94.0	93.0
Propane 70° F.	98.5	97.0	96.0	94.5	93.5	92.0	91.0	90.0	88.5	87.5
Propane 40° F.	97.0	94.0	91.0	89.0	86.5	84.0	82.0	80.0	78.0	76.0
Propane 10° F.	93.0	87.0	82.0	78.0	73.0	69.0	66.0	63.0	60.0	57.0
Propane —20° F.	84.0	72.0	63.0	56.0	51.0	46.0	42.0	39.0	36.0	32.0
Butane 100° F.	93.0	86.0	81.0	76.0	72.0	68.0	64.0	61.0	58.0	56.0
Butane 70° F.	85.0	74.0	65.0	58.0	53.0	48.0	44.0	41.0	38.0	36.0
Butane 40° F.	69.0	52.0	42.0	35.0	30.0	26.0	23.0	21.0	19.0	17.0

Hold differential pressure low

The more resistance there is in the pump discharge line the higher the differential pressure the pump must develop. Differential pressure is defined as the difference between the pump inlet and discharge pressure. The higher this differential pressure, the slower the rate of delivery and the faster the rate of pump wear. It is, therefore, an advantage to have the resistance in the dis-

. . . but 5 big

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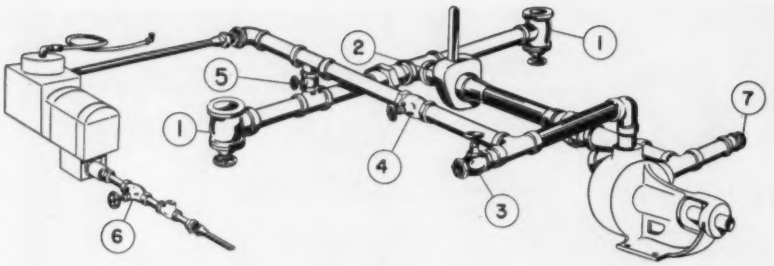


Fig. 6

charge line as low as possible. *Fig. 5* shows a typical bulk truck pump discharge line.

Normally 1¼-in. pipe is satisfactory for bulk truck discharge lines. Pipe smaller than 1¼ in. should not be used just ahead of the delivery hose connection (see *Fig. 5*). If all piping is 1¼ in. or larger, any bulk truck discharge line will have practically the same pressure drop between the pump and the point where the delivery hose is connected, except for the fact that two types of meter back pressure valves are available: the spring loaded, which is probably on its way out, and the differential diaphragm type, which is becoming more and more popular. The spring loaded type is usually set between 10 and 15 psi. It adds this amount of resistance to flow regardless of how much resistance is developed by the delivery hose and valves. The differential diaphragm type requires a connection back to the tank or to the inlet valve side of the pump. This type maintains a minimum of 11 or 12 psi back pressure on the meter, but does so by making up the difference between the resistance of the hose and valves, and the desired back pressure. Since under actual delivery conditions the pressure drop through the hose and tank filler valve will be more than 15 psi, the actual resistance added to the system when liquid is being delivered is practically zero.

Table 4 shows the pressure drop in pounds per square inch between the pump and the delivery hose connection for bulk trucks equipped with either a spring loaded or differential type back-pressure valve. Examination of the figures in this table show that a big advantage can be gained by using a diaphragm type back-pressure valve after the meter. The use of this type of valve can often be the difference between a slow and a fast delivery on those tanks which are particularly hard to fill.

The delivery hose is another item in the pump discharge line which can cause a very large pressure drop and thus slow the rate of delivery if the proper diameter and length are not selected. *Table 5* gives the pressure drop through 100 ft of hose when liquid propane or butane is being delivered. For lengths of hose other than 10 ft, divide the length of hose by 10 and multiply by the figure given in the table. In selecting a delivery hose it is a good practice to select a diameter of hose for the length required, which will result in a pressure drop of 25 psi or less.

Note that for 100 ft of ¾-in. hose delivering liquid propane, for example, at 30 gal. per minute, the pressure drop through the hose alone will be 51.9 psi. If 1-in. hose is used under the same conditions, the pressure drop will be only 12.9 psi. Thus, the use of 1-in. hose alone will reduce the pressure loss by nearly 30 psi under the conditions stated above.. The use of a 1-in. delivery hose instead of a ¾-in. will speed up the rate of delivery considerably.

The globe valve at the end of the delivery hose causes another pressure drop as shown in *Table 6*.

The last item in the system through which the liquid must pass before it enters the customer's tank is the filler valve on the tank itself. The pressure drop caused by this valve is shown in *Table 7*. Most larger tanks have 1¼-in. filler valves. But some smaller tanks have ¾-in. filler valves. If a ¾-in. filler valve is encountered, 10 to 15 gpm is about the maximum filling rate which can be expected.

In order to illustrate the importance of various items discussed in the section, let us compare two pump discharge line designs, one being about the poorest selection possible (Example No. 1), and the other about the best selection possible (Example

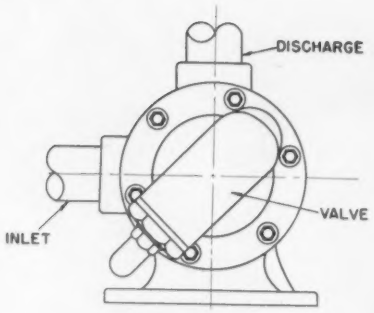
TABLE 4. Approximate Pressure Drop Between Pump and Delivery Hose Connection for Bulk Truck Discharge Line as Shown in Figure 5 Containing a 30 GPM Meter and 1¼-in. Piping.

Flow Rate Gallons Per Minute	PRESSURE DROP IN PSI With Spring Type Back Pressure Valve	With Diaphragm Type Back Pressure Valve
10	12	2
20	16	4
30	22	9
40	29	14

TABLE 5. HOSE PRESSURE DROP CHART

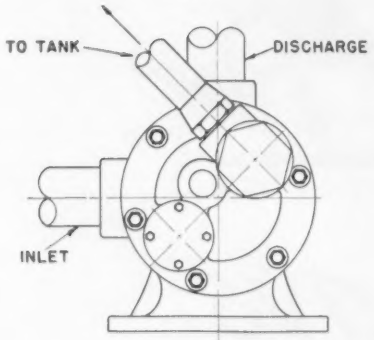
Pressure Drop for 100 Feet of Hose When Delivering Liquid Propane (P) and Butane (B). Hose Sizes Given Are the Actual Inside Diameter. For Lengths of Hose Other Than 10 Feet, Divide the Required Length by 10 and Multiply by the Figure Given in This Table.

Flow Rate GPM	PRESSURE DROP IN PSI FOR HOSE SIZE AND LIQUIDS GIVEN ½-in. Hose B	½-in. Hose P	¾-in. Hose P	¾-in. Hose B	1-in. Hose P	1-in. Hose B	1¼-in. Hose P	1¼-in. Hose B
5	1.44	1.69	—	—	—	—	—	—
10	5.30	6.15	0.66	0.76	—	—	—	—
15	11.80	13.40	1.42	1.64	0.35	0.41	—	—
20	—	—	2.42	2.80	0.60	0.69	0.20	0.23
25	—	—	3.69	4.26	0.91	1.06	0.31	0.36
30	—	—	5.19	6.02	1.29	1.50	0.43	0.49
35	—	—	—	—	1.71	1.99	0.57	0.67
40	—	—	—	—	2.19	2.54	0.74	0.85
50	—	—	—	—	—	—	1.12	1.30



PUMP MOUNTED INTERNAL RELIEF VALVE

Fig. 7



PUMP MOUNTED RETURN TO TANK BYPASS VALVE

Fig. 8

No. 2). Of course, actual bulk truck discharge lines will fall somewhere between these two extremes:

Example No. 1: High pressure drop system. This system is laid out similar to the basic discharge line shown in *Fig.* 5 with a spring-loaded back-pressure valve, 100 ft of ¾-in. hose, and a ¾-in. globe valve on the end of the hose. We wish to fill a 1000-gal. tank having a 1¼-in. filler valve at a rate of 30 gpm. The liquid transferred is propane. What differential pressure will the pump be required to develop?

Pressure drop between pump and hose connection (Table 5)	22 psi
Pressure drop through 100 ft of ¾-in. hose (Table 5)	51.9 psi
Pressure drop through ¾-in. globe valve (Table 6)	11.3 psi
Pressure drop through 1¼-in. tank filler valve (Table 7)	8.5 psi
	93.7 psi

Example No. 2: Low pressure drop system. This system is laid out similar to the basic discharge line shown in *Fig.* 5 with a diaphragm type back-pressure valve, 50 ft of 1¼-in. hose, and a 1¼-in. globe valve on the end of the hose. We wish to fill a 1000-gal. tank having a 1¼-in. filler valve at a rate of 30 gpm. The liquid transferred is propane. What differential pressure will the pump be required to develop?

Pressure drop between pump and hose connection (Table 5)	9 psi
Pressure drop through 50 ft of 1¼-in. hose (Table 5)	2.2 psi
Pressure drop through 1¼-in. globe valve (Table 6)	1.7 psi
Pressure drop through 1¼-in. filler valve (Table 7)	8.5 psi
	21.4 psi

These two examples are intended to be the extreme limits of possibility on a bulk truck. Example No. 1 would certainly be the worst extreme that would be worth considering. Example No. 2 would be an ideal bulk truck discharge line, but in many cases it would not be practical to use a 1¼-in. by 50-ft delivery hose. However, if in Example No. 2 we replace the 50 ft of 1¼-in. hose with 100 ft of 1-in. hose and the 1¼-in. globe valve with a 1-in. globe valve, the total pressure drop will only be increased to about 35 psi, thus giving a practical discharge line with reasonable pressure loss.

In addition to the pressure drop due to the friction in the piping, fittings and hose, there is also a pressure differential between the tank being filled and the tank on the bulk truck. The magnitude of this pressure differential will vary depending on the temperature, the rate of transfer, the nearness to completion of the filling operation, and whether a vapor return line is used. It is, therefore, good practice to have the bypass or relief valve in the system set at about 75 psi and have a discharge line which does not have more than a 40-psi pressure drop when delivering 30 gpm.

Summarizing: It is very important to keep the pressure loss between the pump and the end of the delivery hose as low as possible. In order to do this, particular attention should be paid to:

1. The meter back-pressure valve.
2. The diameter and length of the delivery hose.
3. The type and size of the shutoff valve used on the end of the delivery hose.

Auxiliary piping

Up to this point the pump arrangement and piping described have been concerned with the basic function of the bulk delivery truck to deliver liquid L. P. gas into your customer's tank. It is sometimes desired to have the piping designed so that the pump can be used to perform other functions. The other pumping operations can include: filling the tanks on the truck when a bulk plant pump isn't available, using for transfer operations, or filling cylinders without having to pump through the meter and all of the delivery hose.

TABLE 6. Average Pressure Drop Through Small Globe Valves at Various Flow Rates of Propane, Butane or Anhydrous Ammonia.

Flow Rate GPM	PRESSURE DROP IN PSI FOR GLOBE VALVES ¾ in. Valve	1-in. Valve	1¼-in. Valve
5	0.4	—	—
10	1.5	—	—
15	3.1	1.1	—
20	5.3	1.8	0.8
25	8.0	2.6	1.3
30	11.3	3.6	1.7
35	—	4.8	2.3
40	—	6.2	2.9
50	—	—	4.4

TABLE 7. Average Pressure Drop Through Tank Filler Valves for Various Flow Rates of LP-Gas and Anhydrous Ammonia.

Flow Rate GPM	PRESSURE DROP IN PSI ¾-in. Filler Valve	1¼-in. Filler Valve
5	2.5	0.5
10	8.5	1.0
15	18.0	2.0
20	31.0	3.8
25	—	6.4
30	—	8.5
35	—	11.5
40	—	14.5
50	—	26.0

A new source for nitrogen chemicals

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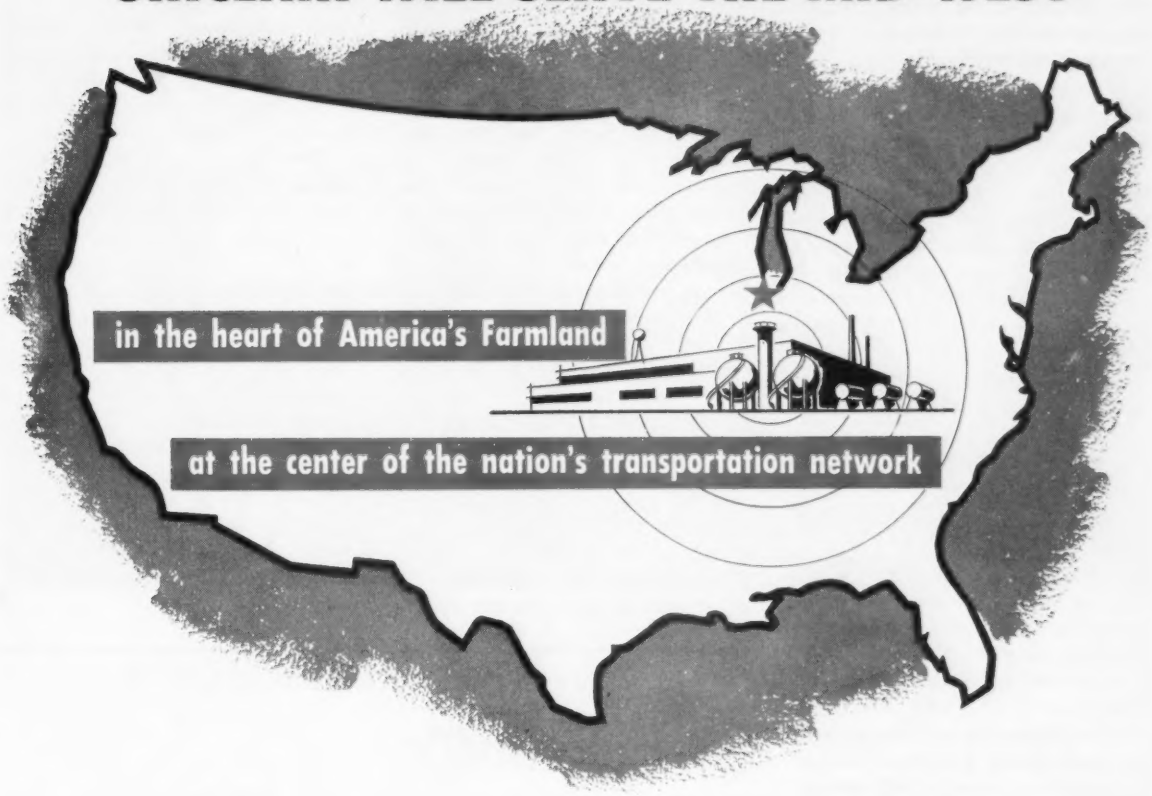

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It is important, however, that auxiliary piping be treated as such. Don't include so many features as to make piping too complicated and thus interfere with primary function of the truck.

The main thing to guard against is the inclusion of too many valves through which the liquid must flow en route from the tank to the pump. An extra valve included in the pump inlet line should be of the full-opening type in order to keep flow resistance to a minimum.

Normally, if an inlet connection is added so that liquid can get to the truck pump from an outside source without passing through the truck tanks, and a discharge connection is added so that liquid can be delivered from the pump without going through the meter and hose, practically any auxiliary or emergency pumping operation can be taken care of.

A piping system of this type is shown in *Fig. 6*. Note that a full opening valve (1) is used in the pump inlet line to keep flow resistance to a minimum.

This type of piping system can be used in three ways:

1. For its primary function of delivering liquid from the truck tanks through the meter and delivery hose. For this operation, Valves No. 1, 2, 4 and 6 would be open. Valves No. 3 and 5 would be closed.

2. For filling the truck tanks with the truck pump. For this operation the liquid hose from a bulk storage tank would be connected to the filler valve (No. 7). Valves No. 4, 5 and 1 would be open. Valves No. 2, 3 and 6 would be closed.

3. Using the truck pump for emergency transfer operations not requiring the use of the truck itself. For this operation a hose from the source of liquid L. P. gas would be connected to filler valve (No. 7). A discharge connection would be made at valve No. 3. Valve No. 3 would be opened. Valves No. 2 and 4 would be closed.

The bypass valve

The pump-mounted integral relief valve shown in *Fig. 7* is intended to be a maximum pressure limiting device to prevent the differential pressure in the system from exceeding a certain predetermined value. It is put on the pump as a safety relief valve and is intended to protect the pump, power take-off, etc., in the event a manual valve is accidentally left closed when the pump is started or a valve is closed before the pump is shut off.

It has been quite a common practice in the last few years to use this valve as a pressure regulating and flow control device on bulk trucks. It is not uncommon for the pump on the truck to displace considerably more liquid than can be forced through the meter, hose, and tank filler valve on at least some of the tanks which must be filled. This excess pump displacement must go some place, so it begins to recirculate around and around through the relief valve. This causes heat. The heat in turn vaporizes the liquid. Large amounts of vapor form at the pump inlet and in the pump. When the pump has to handle large amounts of vapor, several things happen. The pump's efficiency drops and the pump parts wear faster, the operation is noisy and the relief valve poppet will begin to clatter.

If the pump is allowed to continue to operate under these conditions the differential pressure in the system will drop considerably and the rate of filling will become even slower. When this process is repeated several times a day, permanent damage is done to the pump which results in premature failure of pump parts and especially the shaft seal.

The use of the pump-mounted integral relief valve for a pressure regulating and flow control device has probably caused more pump trouble on the bulk delivery trucks than any other one thing. Considerably less trouble would be encountered on bulk truck pumps if a bypass valve, which returns the liquid to the tank, were used.

There are two good arrangements which can be used to accomplish this: A pump-mounted return to tank bypass as shown in *Fig. 8* can be used, or a valve can be piped into the discharge line as shown in *Fig. 9*. Either of these two types will function very well and result in quieter operation, faster delivery of the product, longer pump life, and much less shaft seal trouble. The arrangement shown in *Fig. 8* will usually be less expensive to install.

Summarizing: Don't use a pump-mounted integral relief valve for a bypass or pressure control device. It is intended as a safety relief valve only. ■

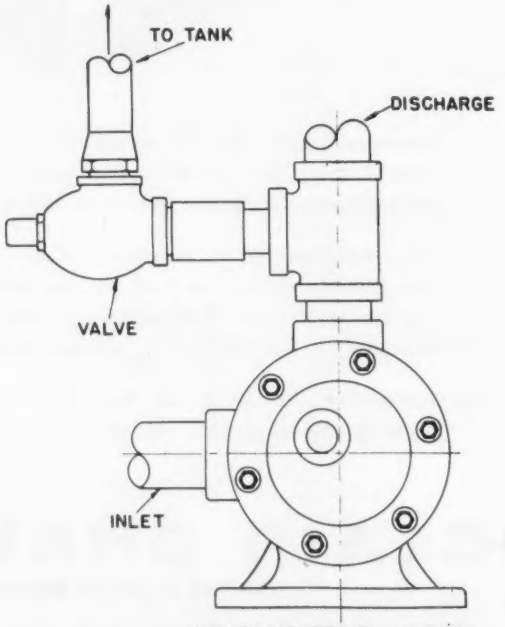
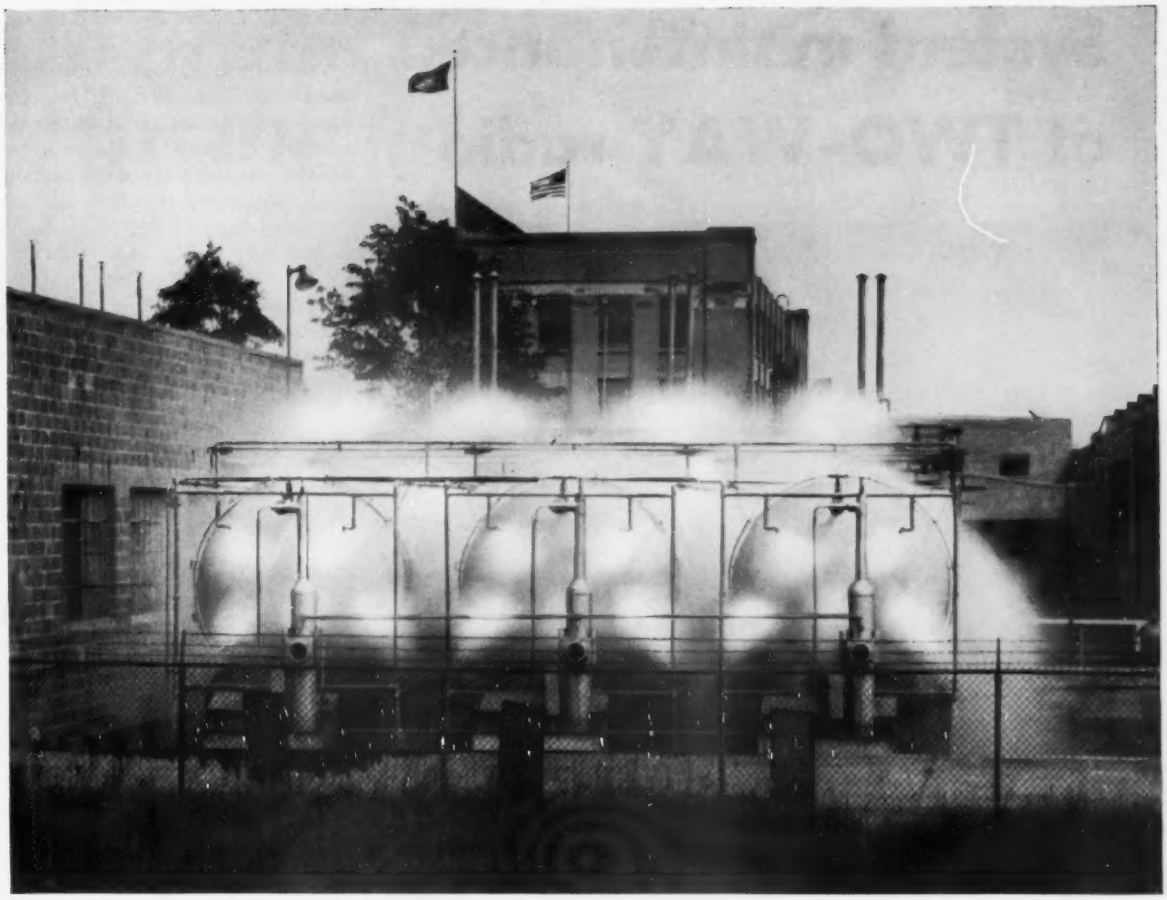


Fig.9



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System maintenance of TWO-WAY radio

Good test equipment is essential to good system performance. It saves time and enables the serviceman to do a better job.

By JOSEPH JATIS

Assistant to National Service Manager • Motorola, Inc.

CONTINUOUS operation of an efficient, dependable and reliable radio communications system requires regular attention to maintenance. It may be true that some radio communication systems will operate with very little attention; nevertheless, to insure continued good performance of the radio communications equipment, it is necessary that a program be developed for periodic checking or testing of the entire system. Any preventive maintenance program, to be successful, must be based on "system maintenance."

What do we mean by system maintenance? The dictionary definition of a system is "an assemblage of objects, united by some form of regular interaction of interdependence—an organized whole." What could be more descriptive of a radio communications system? "System" also means a regular method or order of doing things, as to have a method or system in one's business.

Therefore, system maintenance means the inspection and maintenance of all the units constituting the complete organized whole, in a systematic and planned orderly fashion.

All radio communications systems include integrated assemblages. A failure in any one of these would constitute a failure of communications. However, there are three major factors in a radio communications system that require attention:

(1) The primary power source
(2) The unit assemblages
(3) The antenna system

Any successful maintenance program must include the entire system. It would be of no consequence to maintain the unit assemblages at top efficiency and to ignore the primary power or the antenna. A failure in the primary power system is a failure of radio communications. To be successful in preventive maintenance, a program must be developed and closely followed on a basis of system maintenance. Such a program should include a periodic check on all the factors constituting a radio communications system as follows:

Contrary to popular belief, automobile batteries seldom go dead without warning. They usually fail after a long period of undercharging or overcharging, lack of water, poor connections or old age, with many indications of the approaching end.

From the radio technician's point of view the voltage available at the battery terminals under load is the telling point. A fully charged lead-acid battery under a given load may show a measured voltage of approximately 6.4 volts in the case of a "6-volt" battery and 12.8 volts in the case of a "12-volt" battery. An old sulfated or undercharged battery may show voltages of only 6 volts or lower. These are battery terminal voltages, not the voltage present at the units. The terminal voltage at the units in the trunk of the car will probably be .5 to .7 volts lower when a transmit current of about 40 to 60 amperes is being drawn.

One of the good methods of checking primary power trouble is to measure battery voltage both at the terminals of the battery and at the equipment. An immediate drop in voltage of more than .2 volts measured at the battery on a short trans-

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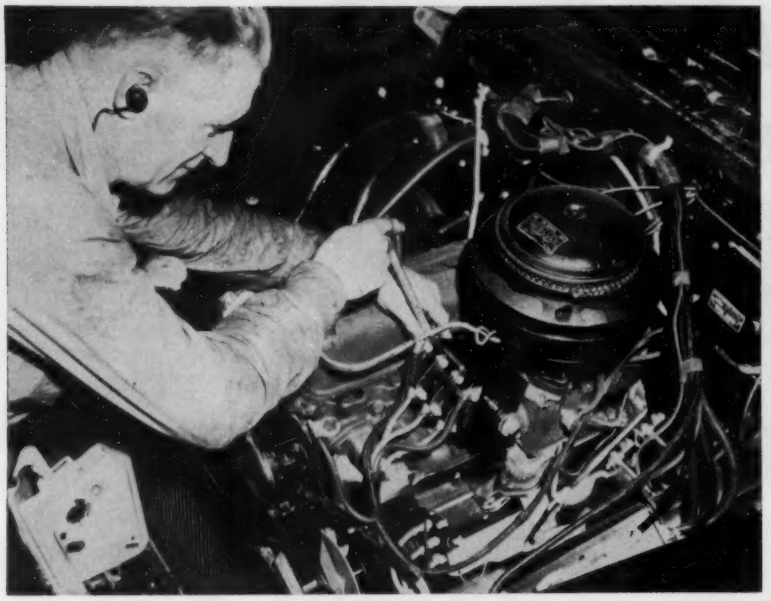

Primary power sources are the first check points in preventive maintenance procedures.

mit cycle would indicate a battery in poor condition. A drop of more than .7 volts measured at the units would point to troubles in the primary circuit—cable, fuse block, relay or chassis return. This voltage drop is excessive and should be investigated fully.

"A" relay contacts wear out, requiring replacement.

Fuses get tired, sometimes even when new they may have too much resistance. Check and replace if voltage drop exceeds .1 volt.

Connections loosen as a result of vibration. Tighten or resolder.

Fuse holders also loosen because of vibration. They lose their temper because of heat resulting from poor contact. Acid causes corrosion. Accumulation of oil and dirt increases contact resistance and the remedial action is to clean contacts, tighten or replace.

Keeping voltage drops to a minimum in a primary circuit is very essential to good system operation. The same rules apply to other sources of power. Dry batteries especially must be checked under full load. Some knowledge of the number of hours of use must be available as an indication of when they most likely will need to be replaced.

AC sources of power are by no means free of trouble. Primary voltages are always suspect in AC circuits as they can often be too high as well as too low. In some cases application of voltage regulators may be necessary. Loose connections on fuses occur even in AC circuits. A hot fuse or connection is always a key point for a good maintenance man to investigate.

Primary power sources should be the first check points in preventive maintenance procedures and should be checked periodically.

Unit assemblages include transmitter, receiver, power supply, etc. In maintaining unit assemblies the secret lies in knowing what to do and what to leave alone. Very few adjustments need to be made regularly in transmitter and receiver units. To catch a maximum number of incipient troubles, the technician must use his eyes, his ears, his sense of touch, and meter measurements, as well as his good judgment and past experience.

Basically four types of observation are required.

Listening tests. An experienced technician can often detect warnings of impending trouble by noting the audio quality, the noise background and the squelch operation in relation to the settings of the volume and squelch controls. He will come to know the normal signal level he should obtain at given locations with selected stations in a particular system. Degradation of performance will be immediately apparent to the technician who checks the set periodically, whereas the steady operator may become accustomed to a gradually degraded performance.

Visual inspections. Look for loose bolts, screws and clamps, worn microphone cords, burned out pilot lights, arcing at any point, loose or broken components, burned resistors, or loose connections. A good visual inspection not only is a means of quickly locating the source of trouble, but may prevent more serious trouble from developing later.

Touch. The fingers are good detectors of improper temperature conditions. Fuses, fuse holders, crystal ovens, transformers and relay coils which are too hot mean trouble. Also, a cold crystal oven, tube or resistor that should normally be warm is probably in trouble. Such tests are quick and should be used often.

Meter measurements. Actual quantitative measurements of "A" and "B" voltages, grid and plate currents, power output, frequency and deviation have no substitute; their meaning is definite. Experience will indicate to what degree variation can be tolerated.

Good test equipment is essential to good system performance. Test equipment is not an expense—it is an investment. Its cost can be recovered in the saving of time and material on any system operation. It is a tool to do the work quicker, more easily and better.

Visual check of antenna, line and tower lights, mobile antenna mount, cable, and connectors should be made periodically, as well as a meter check to find any open or shorted lines or high standing wave ratios. Remember that the antenna must efficiently radiate the power developed in the transmitter chassis and also transfer to the receiver the minute voltages picked up from the distant transmitter to produce a good audible signal. Failure of the antenna or line is a failure of the communications system.

Some radio communications systems have been operating with no safety factor whatever, and the slightest drop-off results in a trouble call. Such systems cannot be maintained at a reasonable cost. On the other hand, many systems have a quite adequate safety factor and these systems sometimes deteriorate to an

amazing extent before complaints arise. However, the technician should know to what extent he can allow transmitter power output and receiver sensitivity to drop without degrading operation. It is perfectly sensible economy to get all the performance possible out of each component, but there is always a danger point below which performance must not be allowed to sink. Only frequent inspection will show when equipment is approaching that point.

Netting

Netting of receivers and transmitters in any system is more important than usually realized. The term "netting" means that all receivers and transmitters in a given system are aligned on the same frequency. With modern selectivity requirements, it is more than every necessary to tune every receiver exactly to the station it must receive. Careful netting of all units in an integrated system to the correct frequency is a first-order requirement of a modern communications system and will eliminate a prime cause of poor system performance.

Frequent checks of transmitter deviation will also do much to improve system operation. Frequency and deviation checks are more important from a system operation standpoint than the twice-yearly FCC regulations seem to indicate. The technician should be sure that transmitters are swinging a normal ± 15 kc for standard channel and ± 5 kc for split channel operation. Under-deviation does not develop the full advantages of frequency modulation.

A good rule to follow is to check performance frequently and make adjustments only when actual tests and measurements show improper operation. Adjust nothing without meters and signals to indicate actual conditions. This is one area in which one's ear isn't a good meter.

Check list

A good preventive maintenance program would require a complete check at least every three months. In a general way the following items should be part of any preventive maintenance routine.

1. Clean and dust thoroughly.
2. Check primary voltage circuits.
3. Measure power output of transmitters.
4. Measure sensitivity of receivers.
5. Check meter readings at the metering positions of transmitters and receivers.
6. Check audio output of receivers and audio input to transmitters.
7. Check operation of all relays.
8. Measure frequency and deviation of transmitters.
9. Check and adjust frequency netting of the entire system.
10. Check all accessories; control heads, cables, microphones, pilot lights, etc.
11. Check the antenna system.
12. Check and adjust remote control levels.
13. Check power supply output voltages.
14. Actually make an operational listening test of transmission and reception.

The success of preventive maintenance procedures will depend on the attention paid to each detail of the system maintenance program. Such a program intelligently applied as a planned, periodic, complete system inspection will pay off in dollars, as well as in continued good system operation. It will give greater satisfaction in operation of radio communications and it will insure continued reliable communications at all times. Best of all, perhaps, you will have the inner satisfaction of a "job well done."

We find that a good preventive maintenance program will be successful if we but follow some basic rules dilligently such as:

1. Maintain primary power at proper levels.
2. Check system "netting" frequently.
3. Be observant and react to your senses: hearing, seeing and feeling.
4. Keep equipment clean and dry.
5. Keep individual records of each unit.
6. *Do believe the user.* If he says the operation is faulty, you may be quite sure the system is not working properly even though his description of the trouble may not be quite accurate, or your cursory test may indicate that everything is all right. Search out and find the difficulty.
7. Follow your preventive maintenance program consistently; perform each recommended precedure without fail. ■

A visual check of mobile antenna, mount, cable, and connectors should be made periodically.

Appreciation is expressed to Frank Bramley, Motorola's New England regional service manager, for his contributions in the preparation of this article.

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WHAT'S NEW IN PRODUCTS AND TRADE LITERATURE

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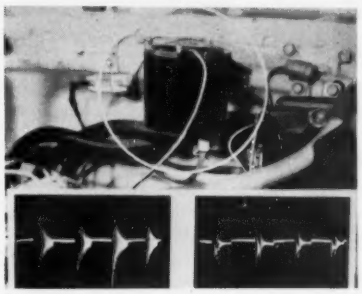

High frequency coil

Model: Mitchell Hi-Q Ignition Coil

Description: This high frequency coil, which insures maximum horsepower from today's high octane fuels, works equally well on high-test gasoline or LPG engines, according to the manufacturer.

The development superimposes a high frequency wave on a high voltage spark of long duration. The result is improved combustion, increased acceleration, and smoother performance at all speeds. The coil carries a 100,000-mile or life-of-the-vehicle guarantee.

The illustration shows the unit installed on a 1953 Olds. Under this are scope pictures illustrating the frequency and duration of spark with the unit (left).

Features claimed: Coils that have been in operation on truck fleets and automobiles show that the Mitchell Hi-Q insures instant starting.

Adair Co.

*Circle **1** on Readers' Service Card*

Synchronous motor

A synchronous motor with bearings that require no lubrication, thus eliminating the formation of gummy residues, has been introduced by the Lux Clock Co.

Description: Specifically designed for use in gas and electric range, washer, and dryer timers (and in any original equipment where heat poses a problem). Rounded ends of the rotor shaft ride in cup-shaped bearings, with a specially desgined spider-spring mount taking up end play on pivots.

Features claimed: Development assures constant torque output and continuous accurate positioning of the rotor pinion in relation to the first gear. In addition, wear- and noise-producing shaft vibration is compltely eliminated.

Lux Clock Manufacturing Co.

*Circle **2** on Readers' Service Card*

■

LPG transport

New, single barrel transports, incorporating the latest engineering developments and designed to enable LPG distributors to transport larger loads on the highway, are now in production at the Delta Tank Manufacturing Co. plant.

Description: The new "neck-down" transport, designed to lower the center of gravity by 6 in., has a capacity of 8000 gals. of propane. It holds a 34,878-lb payload and has a gross loaded weight of 58,878 lb. Unit length is 36 ft, 8 in., and tank diameter varies from 78 in. at one end to 84 at the other.

By comparison, the 9400-gal. water capacity standard model transport weighs 24,000 lbs empty and carries a 47,030 pay-load.

Delta Tank Manufacturing Co.

*Circle **3** on Readers' Service Card*

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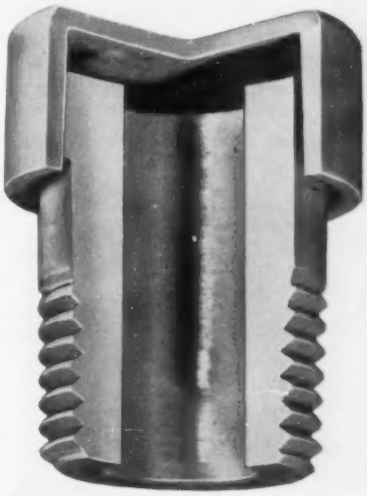


Plastic vent cap

This low-priced plastic vent cap is designed to prevent plugging of vent ports by insects or corrosion products, and to stop rain water from entering the regulator. It has long, narrow venting slots which allow ample venting capacity but are too narrow to be plugged by insects and are so positioned that the entrance of rain water is prevented.

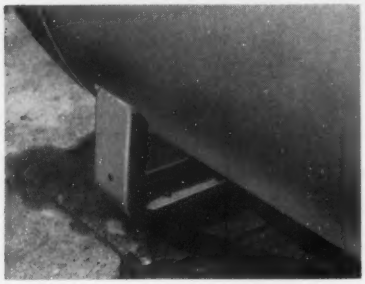
For further information on these products use Readers' Service Cards on pages 65 - 66

The plastic material is cycolac, which has exceptional impact strength, toughness, and good resistance to outside weathering. To reduce regulator pulsation, the vent cap can be supplied with a stainless steel disc in the cap, which acts as a check valve.

Modern Utility Supply Co.

Circle 4 on Readers' Service Card

■



Tank supports

Description: New, 1-piece channel supports with more than 200 sq in. bearing surface at the point of contact to the foundation are now part of Black, Sivalls & Bryson "Perfection" propane systems. These are made in 250-, 500-, 750- and 1000-gal. capacities.

The support is a 1-piece, heavy gauge, pressed steel, wrap-around type, which gives positive, level support to the tank during its lifetime.

Black- Sivalls & Bryson Inc.

Circle 5 on Readers' Service Card

■

Gas water fountain

"Pride of the Farm" fountains keep plenty of fresh water always available—automatically—for stock on the farm.

Model: E-2.

Description: This is a combination trough for hogs and cattle. The lids open only when livestock is drinking, and close automatically. The lids save heat in winter and keep water cooler in summer.

The fiber glass insulation is moisture-proof and prevents rust from forming. Special thermostat keeps water ice-free even in sub-zero weather. Cast iron mud grates, set above the bottom of troughs, keep water clear and clean.

Model E-2 will serve approximately 70 head of cattle and 250 head of hogs. Models can be purchased with one or two hog troughs or with one trough for cattle only.

Hawkeye Steel Products Inc.

Circle 6 on Readers' Service Card

■

Water heater

The Harrison is an automatic water heater of square design to blend with other kitchen appliances.

Model: Empress.

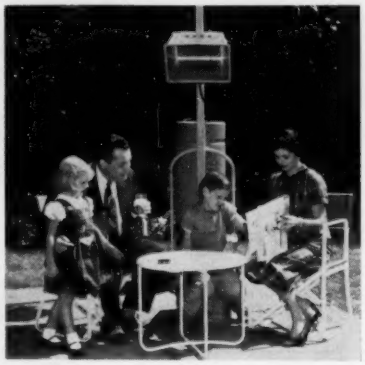
Description: Engineered for long life, this 1956 model features 100% Grayson controls, built-in pilot filter, two-tone enamel finish, clog-proof burner and "Flexi-Glas," non-chip lining.

It is available in 30-, 40-, 50- and 60-gal. sizes.

Harrison Steel Cabinet Co.

Circle 7 on Readers' Service Card

■



Infra-red heater

Model: Infra-Red gas heater

Perfection's new heater extends the use season for the porch or patio a full 10 to 15 weeks each year.

Description: The new heater heats only objects touched by its rays, without heating the air between. Thus, it is economical for use outside as well as inside. For patio or porch heating, a portable unit using LPG as fuel is available. Or, the heater is attached to walls or posts.

Perfection Industries Inc.

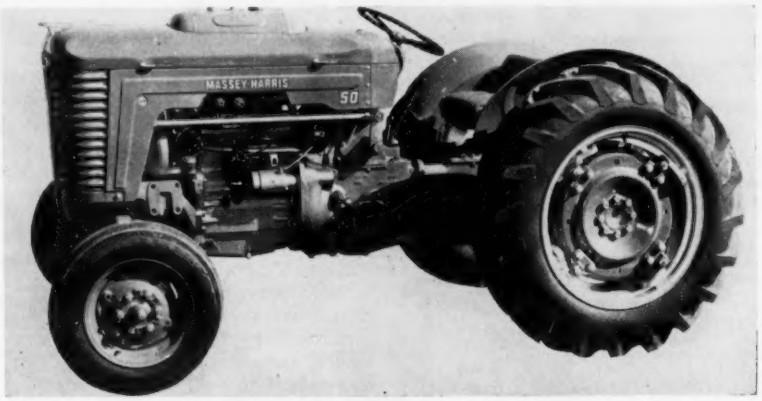
Circle 8 on Readers' Service Card

■

Tractor tank

Model: Custom-Built (Catalog H-6)

Application: Sante Fe Engineering has designed this 19 water gal. L. P. gas tank for the Massey-Harris 50 tractor (shown below).



For further information on these products use Readers' Service Cards on pages 65 - 66

Description: The tank is positioned extremely low in order to maintain the streamlined appearance of the tractor. Filling and service valves are carefully placed in a convenient, out-of-the-way position so that the tractor hood may be raised for access to the radiator, battery, etc.

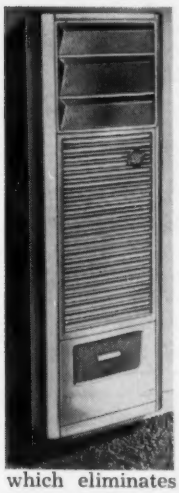
Tank is furnished complete with cut-out patterns and rubber trim for the cut hood edges.

Santa Fe Engineering & Equipment Co.

Circle **9** *on Readers' Service Card*

■

Unit heater



A new vented gas heater has been introduced by Quaker Manufacturing Co., heating division of Florence Stove Co.

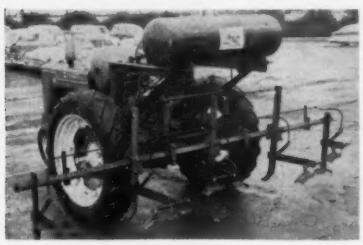
Description: This new AGA approved 25,000-Btu vented heater "hangs on the wall like a picture." Unit can be vented directly into wall or it can be vented from the top into chimney outlet, which eliminates need for cutting into wall Only 7 in. deep, it requires no floor space, and eliminates unlivable zones in front or at sides of heater. Special baffling keeps the back and sides of this new heater cool to the touch, thus eliminating danger of scorched walls, draperies or furniture.

Made with Minneapolis-Honeywell Addatrol, this heater also features double porcelained combustion chamber, deep port cast iron burner, and "Air Stream" construction for increased warm air circulation.

Quaker Manufacturing Co.

Circle **10** *on Readers' Service Card*

■



Flame weeder

A flame weeding machine developed specifically for cotton cultivation is manufactured by Gas Tools Inc., a subsidiary of Van Horn Butane Service. Not only does this machine destroy weeds but acts as an insect exterminator, both resulting in higher crop yields.

Model: Kil-Burn.

Description: The 1956 model Kil-Burn introduces several innovations. The water vaporizer is eliminated and the vaporization is taking place in the burner head. This simplifies installation and service work and maintains an even rate of vaporization. The new burner heads are of cast bronze instead of fabricated steel which extends their life. Tank brackets and valves have been improved and strengthened as have other structural parts.

Gas Tools Inc.

Circle **11** *on Readers' Service Card*

Vapor meter

A new L. P. gas vapor meter, developed specially for LPG dealers who bill through individual household meters, is in production by Neptune Meter Co. It is called the "Blue Seal" and complements Neptune's Red Seal liquid meters.

Model:NP-40.

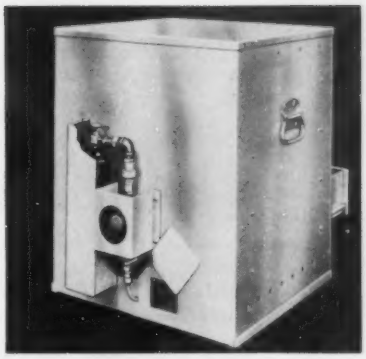
Description: The Blue Seal meter is based on the two-diaphragm slide valve principle.

This meter features a heavy brass casing, thoroughly weather-tight, which permits outside settings without danger of corrosion. Wide seams are lapped and solder-sealed to prevent leaks. It is rated at 42 cfh with propane, and 37 cfh with butane. Accuracy is sustained over the full range from pilot-burner to full load.

Available in choice of straight-reading or dial-reading types, the index is calibrated in cubic feet, therms, decitherms, pounds, gallons, or other units by which L. P. gas is commonly sold. Maximum working pressure is 2 psi.

Neptune Meter Co.

Circle **12** *on Readers' Service Card*



Portable food carrier

A new application of L. P. gas is that of providing heat for portable food cabinets which are designed for in-plant and portal-to-portal food service conveyances.

Model: H-331-G.

Description: Called the "Cres-Cor Hot Stuff," this propane-heated cabinet has large capacity, with pull-out display drawers, and can be operated for as little as 9 cents per day for fuel cost as compared to $1.34 per day per unit for the canned heat formerly used.

Sized to be carried in delivery-type trucks, the cabinet acts as a sales and display counter. "Hot Stuff" is a self-contained, drawer-type unit, heated evenly by a fixed burner with a controllable flame. One bottle of L. P. gas lasts from 12 to 18 hours of continuous operation.

Crescent Metal Products Inc.

Circle **13** *on Readers' Service Card*

■

Portable radiophones

A new line of transistorized portable two-way radiophones, delivering up to 20 times the RF power output conventionally attained in such equipment, has been announced by Motorola's Communications and Electronics division.

Description: The complete line includes models with RF power output ratings from 1 to 8 watts, with a decrease in weight and size of as much as 50%. The smallest model

weighs only 7 lb, 9 oz complete. A full 8 watts transmitter power output is realized from a model weighing only 15½ lb. The extensive utilization of transistors, including use in transistorized power packs, also extends battery life for minimum operating costs.

Another feature of the equipment is the "snap-on" power pack. Dry cell, wet cell and 117-VAC power packs are interchangeable. The wet cell power pack employs new, lifetime, rechargeable nickel-cadmium cells and includes the option of operation from 6- and 12-volt vehicular type batteries.

Motorola Communications & Electronics Inc.

*Circle **14** on Readers' Service Card*

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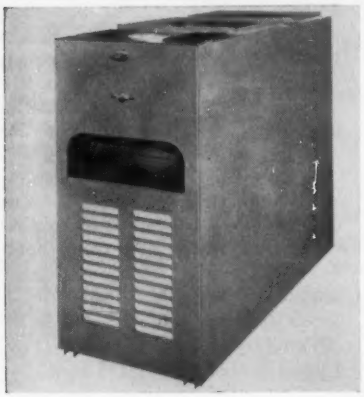

Air conditioner

This winter air conditioner is designed for the addition of summer cooling units at any time. There are three Hiboy and three Loboy models, with inputs of 80,000; 100,000 and 125,000 Btus. All units are shipped from the factory assembled, and are suited for basement, utility room or closet installation.

Model: Gordonair.

Description: Extreme fuel economy in the gas units is achieved by the use of the Gordon single-port spreader-flame burner. The chrome-alloy cast flame-spreader distributes the flame so that every square inch of the heating surface is utilized.

The heavy gauge steel die-formed heat exchanger with gas-tight radiator provides the secondary heating surface. The stainless steel economizer is built into the heat exchanger for maximum extraction and designed for fast heating without expansion and contraction noise.

Roberts-Gordon Appliance Corp.

*Circle **15** on Readers' Service Card*

Spray nozzle

A new spray nozzle for protection of transformers has just been announced by Bete Fog Nozzle Inc. It has been tested and approved by the Factory Mutual Laboratories.

Model: T-1.

Description: With only four Bete T-1 nozzles per transformer, it is now possible to isolate or extinguish a transformer fire before it spreads to other equipment.

This nozzle delivers approximately 80 gpm at 25 psi with a driving 80° full-cone spray pattern suited to outside work under all weather conditions, according to the manufacturer.

The T-1 is made of cast bronze. All passages are large and non-clogging. It has 2-in. female pipe thread.

Bete Fog Nozzle Inc.

*Circle **16** on Readers' Service Card*

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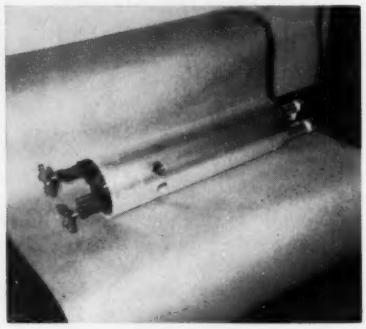

Self-vaporizing burner

Application: Ransome's new self-vaporizing burner is suitable for flaming ditch banks and fence lines and for flat flaming of alfalfa and other fields. Other applications include air heating for mobile grain dryers and mobile orchard heaters.

Description: Design and construction permit burner capacity to be turned down to a low capacity without overheating the vaporized fuel.

Ransome also has added a Model LP-40 to its line of self-vaporizing burners. This burner is 4 in. in diameter, 20 in. overall in length, weighs 15 lb, and has a capacity of 2 million Btu/hr.

Ransome Co.

*Circle **17** on Readers' Service Card*

Trade Literature

LPG metering film

"Beyond the Mains" is the title of a new 16-mm, half-hour color and sound movie explaining the reasons for metering and showing in detail how LPG fuel meters are made and tested. The film has been released by Rockwell Manufacturing Co.

Professional actors, utilizing the familiar story-within-a-story technique, explain the advantages of fuel metering from the point of view of the fuel dealer and the consumer. The film shows how meters operate and the standards of accuracy they are required to meet.

Rockwell Manufacturing Co.

*Circle **18** on Readers' Service Card*

■

Heating control catalog

General Controls' new automatic heating controls catalog presents many new items plus the latest improvements and changes in its line of gas heating controls.

Also listed are the locations of General Controls' five plants, seven warehouses, and 42 factory branch offices operating throughout the U. S. and Canada.

General Controls Co.

*Circle **19** on Readers' Service Card*

■

Heater brochure

The Republic Heater division of Odin Stove Manufacturing Co. has produced a new colorful 20-page brochure containing complete specifications and warranty information on its line of gas water heaters and gas incinerators.

Republic Heater Div.

*Circle **20** on Readers' Service Card*

■

Heat transfer data

Downingtown's new heat transfer bulletin presents data and illustrations of interest to designers and users of custom-built heat transfer equipment. A table of heat transfer rates for various duties is presented, together with tube sheet layout tables and a sample calculating sheet.

The 16-page bulletin (HE) also illustrates and describes a number of heat exchanger types designed and built by Downingtown.

Downingtown Iron Works

*Circle **21** on Readers' Service Card*

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about New Products in this issue . . .

use these time-saving

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First Class Permit No. 6955, Sec. 34.9 P. L. & R., Los Angeles, California

BUTANE-PROPANE NEWS
198 SOUTH ALVARADO ST.
LOS ANGELES 57, CALIF.

KEEP UP WITH WHAT'S NEW
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April 1956

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Here are the features your next delivery unit should have..

AND ONLY AMERICAN GIVES THEM TO YOU

A Custom Unit at Lowest Cost

New super-safe plumbing system increases pumping capacity . . . makes delivery faster . . . saves time and money.

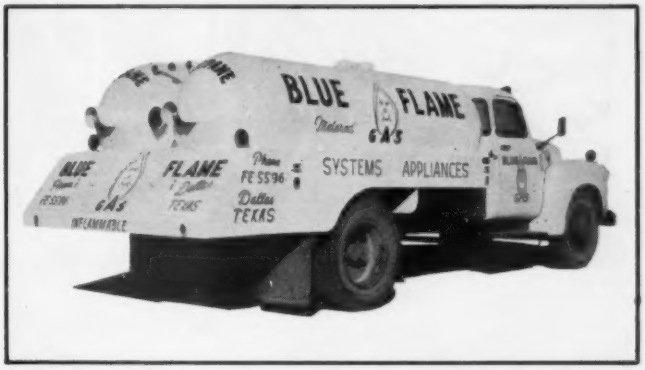
Tanks are locked to truck. Positively won't slip forward . . . a great driver-protection feature in case of accident.

Best balanced units on the road. American delivery units save wear and tear on trucks, give greater safety.

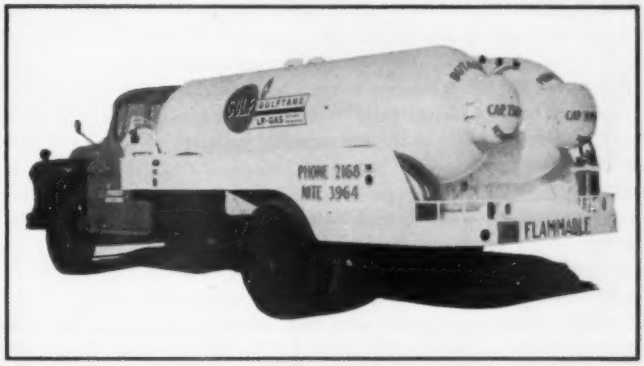
Motor fuel tank and meter mounted in rear . . . can't be side-swiped or sheared off . . . another American safety feature.

Quick changeover . . . when your long lasting American tanks are ready for a new truck, they can be changed over in just a few minutes . . . another American plus.

Good Looks . . . American delivery units are streamlined and good-looking . . . give you the extra safety you need with the smart appearance you want.



Deluxe Model N17. A completely enclosed, compact unit designed with all controls, motor fuel tank, meter, hose reel, power take-off and clutch controls in rear cabinet. Particularly desirable for dealers in northern areas . . . keeps all controls and equipment clean, fully protected from snow, ice or rain.



Deluxe Model B21. Fuel tank and fire extinguisher located in rear . . . meter and hose on catwalk next to driver. Also available with fuel tank, clutch, power take-off and hose reel in rear.

FINANCING AVAILABLE — Write for Information

HEADQUARTERS FOR THE LP GAS DEALER
1 order • 1 shipment • 1 invoice

Telephone STerling 4916

American Tank
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ALSO AVAILABLE AT·

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P. O. Box 2563
Highway 80 East, Phone 3-8726

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Pete discovers flame cultivation

By J. ARTHUR THOMPSON

PROPANE PETE had been busy for quite a spell. He'd been preachin' the gospel of L. P. gas to anybody and everybody that would listen to him. Particularly, he'd been tryin' to convert a young chap by the name of U. C. Roney, down in Corsicana, Texas. This chap Roney was an up-and-comin' feller and Pete figgered he'd be a mighty likely convert, once he'd convinced him, but Roney was a guy that just had to be shown.

Late in the afternoon one fine spring day, Pete was drivin' his old truck Beepee along a back road near Corsicana and tryin' to figger how he was goin' to put his story across. Beepee was rattlin' and groanin' worse than usual. Pete just hadn't had time to tighten things up and get Old Beepee into decent shape.

There'd been a bit of highwater recently and all of a sudden Pete came to a bridge that just wasn't there. He stopped and looked around but there didn't seem to be any easy way across the gully where the bridge had been. So Pete backs up a ways and took off thru a patch of young cotton. It was rough goin' but he finally made it and he took a terrible shakin' up before he got back on the road again.

By the time he did git back on the road it was gittin' late and Pete was hungry so he hightailed it on into Corsicana, altho he had a pretty good idea that he'd lost a part or two off the truck. It didn't rattle quite the same.

Well, it so happened that night that Pete gets into a big hassle wih a guy representing the electric light company. When the bystanders got the two of them pried apart, the local J. P. tells Pete: "$15 and 15 days." Pete figgers it's a bum rap but he's trying to make a good impression so he just does his time as quiet and easy as possible. At that he gits out before the electric guy is circulatin' again.

Old Beepee was standin' right where he'd left it. He looked it over and discovered that sure enough he'd lost several parts off it in that ride thru the cotton field. Among other things, he'd lost the bottom plate off the transmission case. That transmission had come off an old Maxwell and Pete couldn't very well replace it.

So Pete drives back out to the cotton field to look for the plate. It had been better than two weeks since he'd been thru there and the weeds had grown so much that he couldn't even see where he had been. Things grow fast and big in Texas and those weeds were nearly chokin' the cotton to death.

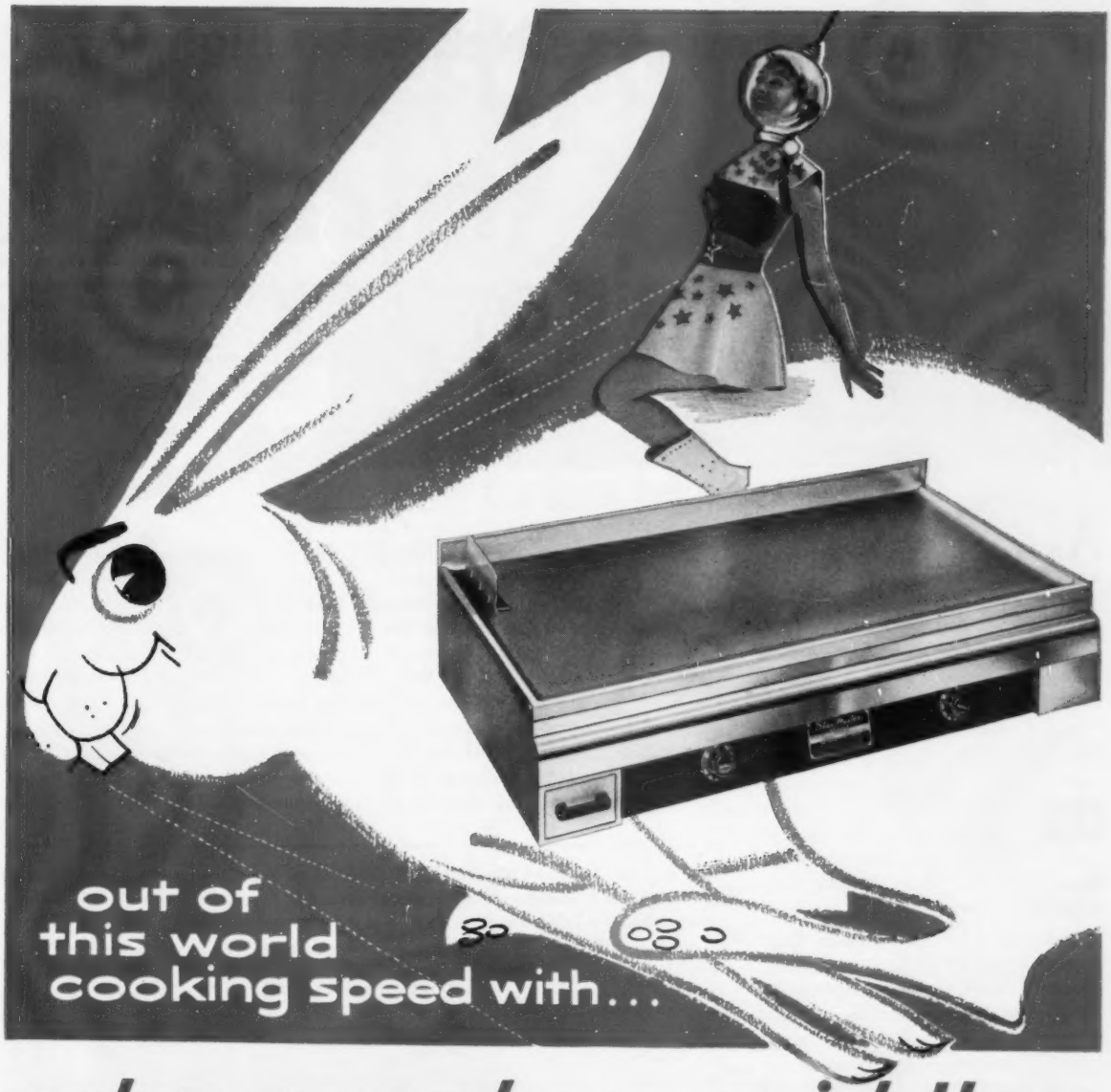
A couple of negro boys was hackin' at the weeds but they wasn't makin' any headway. Every time they chopped down a weed, three more bigger ones sprang up from the roots. Weeds grew so bad that year that over in the next county several field hands starved to death when they got lost in the weeds of a cotton field.

Well Pete just had to have that plate and the other pieces that had fallen off of Old Beepee. It was a sure-fire bet that the way things was, he wouldn't be able to find them before cold weather killed off the weeds. And he couldn't afford to wait that long.

Pete rigs a pair of hoses onto his tank and puts a burner on the end of each one. Then he hired those two colored boys to ride on the fenders and squirt burnin' propane on them weeds. That was the start of flame cultivation.

He just burned them weeds to a crisp and never touched the cotton. He found the plate and the other stuff after he'd burned over nearly the whole field.

Well, sir, that there cotton made three bales to the acre and the owner of the place was tickled pink. But from Pete's viewpoint, the biggest return on his invention of flame cultivation was findin' his stuff and the conversion of U. C. Roney to the merits of L. P. gas. And I hear tell that Roney's Inc. down in Corsicana is doin' all right now days. ■



starmaster griddles

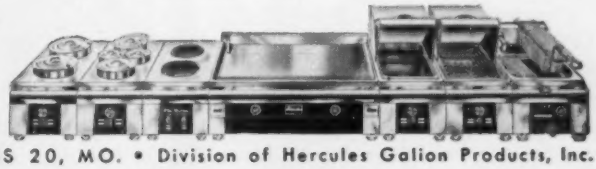
Gas and Electric Models Available

New Starmaster Griddles have speed to spare, enough to meet the cooking demands of any operation. Here are tough, rugged griddles that will give years of heavy duty service at a surprisingly reasonable cost.

Starmaster features advanced engineering and design, beautiful stainless steel construction. Brilliantly polished griddles surfaces are unusually heavy-duty steel plate. They can't crack and won't warp under the most severe usage.

Each is carefully tested for perfect performance. Twenty-four and thirty-six inch models are available.

Visit your dealer. Compare Starmaster Griddles with any, for design, performance and construction features. Then look at prices. You'll agree that Starmaster Griddles stand out for value. See the complete Starmaster matched line. There is a Starmaster Unit for every counter cooking need.

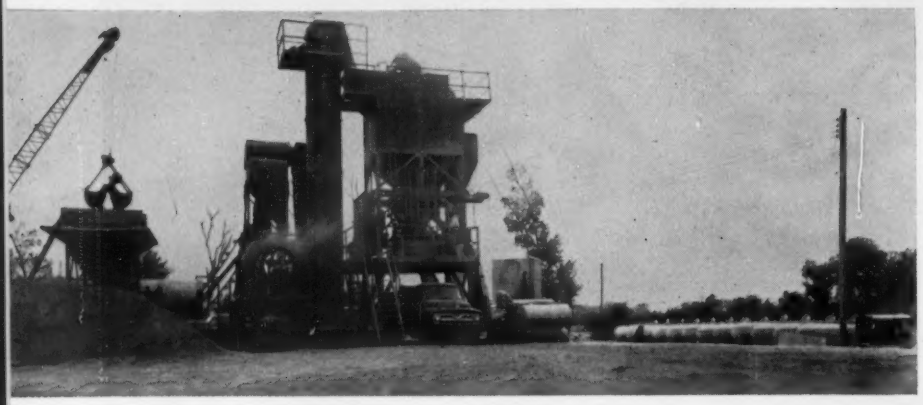


STAR

STAR MANUFACTURING COMPANY • ST. LOUIS 20, MO. • Division of Hercules Galion Products, Inc.

Canadian Distributor: CROWN ELECTRICAL MFG., LTD. • BRANTFORD, ONTARIO, CANADA

LPG helps resurface Nebraska highway



Dobson Construction processed nearly 20,000 tons of asphalt with this special L. P. gas heating plant during a four-week resurfacing project on a Nebraska highway southwest of Omaha.

AN impressive inroad was made into the paving industry recently when liquefied petroleum gas was used to process nearly 20,000 tons of hot mix asphalt aggregate during a four-week resurfacing project on a state highway southwest of Omaha.

This is believed to be one of the first times that L. P. gas has been used to heat a highway contractor's asphalt plant. A similar installation, however, has been in use for several years at the Sky Line Quarries near San Francisco. (See BUTANE-PROPANE *News*, December 1953, p. 56.)

Spokesmen for the Dobson Construction Co. of Lincoln said their specially fired furnace resulted in substantial operating economies. Anthony Vidlak, Dobson's project engineer, said the experiment was so successful that the same technique will be used for future projects in areas not serviced by natural gas lines.

Fuel for the Dobson field furnace was supplied from a battery of 12 L. P. gas storage tanks fabricated by Delta Tank Manufacturing Co. Inc. of Baton Rouge.

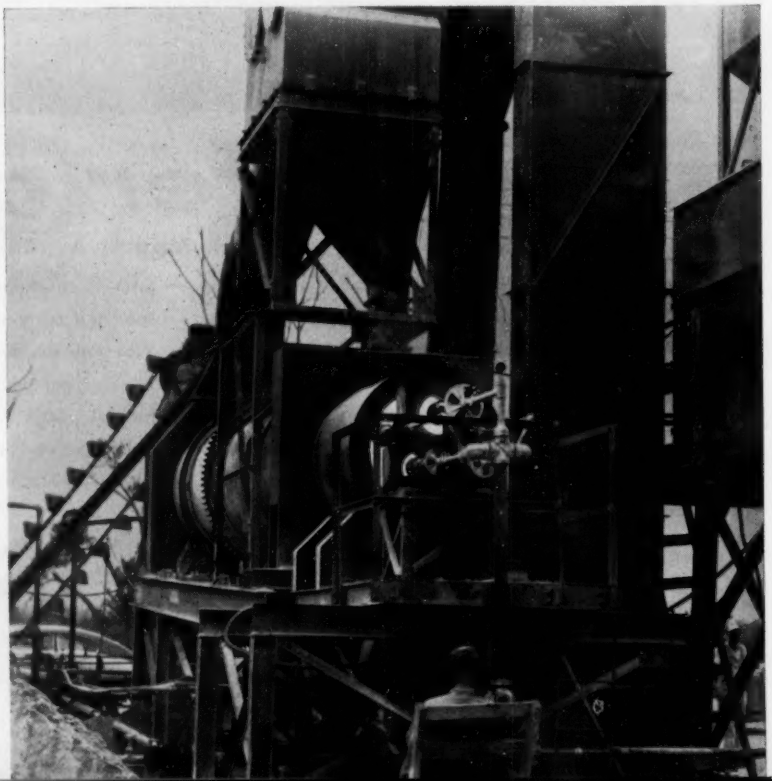
The L. P. gas heating system was mapped out and placed in operation by American Propane Gas Inc., Omaha, area distributor of L. P. gas and Delta storage equipment.

American Propane officials said LPG consumption at the Dobson firm's special asphalt plant—set up along the Platte river near Gretna, Neb.—averaged about 1500 gal. per day during the resurfacing project. Between 650 and 700 tons of asphalt were treated daily and the project was completed before the target date.

L. P. gas, fed at tank pressure through a manifold connecting the battery of tanks, was reduced to 50-lb pressures as it entered the burners. Since the five burners had been designed to operate on natural gas, it was necessary for the American Propane Gas Co. to experiment with smaller orifices in order to produce the most efficient flame with LPG.

American Propane officials reported that each load of processed asphalt was checked by highway department engineers as it left the Dobson furnace. During the entire 28-day heating project, only three loads were rejected because of improper temperatures—all three rejections occurring on the first day before equipment adjustments were completed. ■

Heat chamber of special LPG-fired heating plant (shown in center of photo) used about 1500 gal. of L. P. gas daily during 20-day resurfacing project. L. P. gas, fed by battery of 12 1000-gal. storage tanks, was reduced to 50-lb. pressure as it entered the burners.



The Fastest Growing Sales Opportunity of the Year!

THE *New* FAST SELLING LOW COST GAS CENTRAL HEATING UNIT

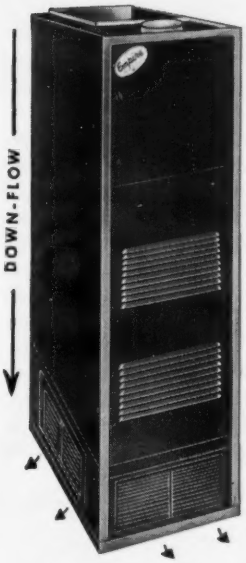
Empire LOW COST FA SERIES

HERE'S A FAST TURN DEAL

THAT'S PACKED with *Profits*

Sells Month After Month

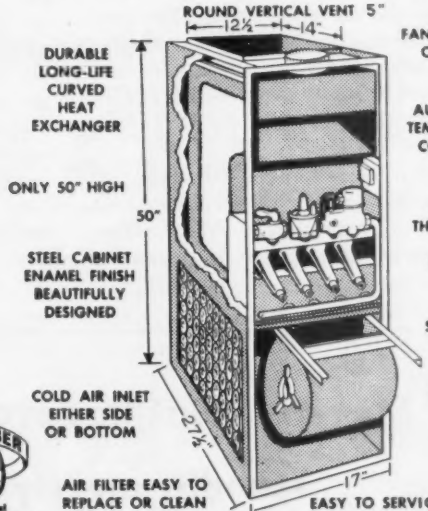
EASY TO INSTALL • FITS IN SMALL SPACE

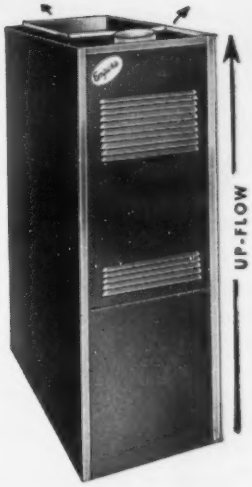


MODEL No.CFA 6100
100,000 B.T.U. INPUT

MODEL No. CFA 675
75,000 B.T.U. INPUT

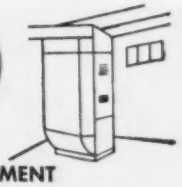
IN TINY CLOSET





MODEL No. FA 1006
100,000 B.T.U. INPUT

MODEL No. FA 756
75,000 B.T.U. INPUT



BASEMENT

UTILITY ROOM

Make extra sales that has all these features!

Write for Further Information

EMPIRE STOVE COMPANY
BELLEVILLE, ILLINOIS

Sale of gas appliances to hit new peaks in 1956

ANTICIPATED SALE OF GAS APPLIANCES 1956 — GAMA SURVEY 2/8/56

	Estimated 1955 unit shipments	Consensus 1956 unit shipments	% Change
Domestic gas ranges	2,277,000	*2,289,000	.5%
Automatic gas water heaters	2,762,000	2,773,000	.4%
Central gas heating equipment	1,151,000	1,224,600	6.4%
Warm air furnaces	850,000	898,000	5.7%
Boilers	91,000	108,000	18.7%
Conversion burners	210,000	218,600	4.1%
Vented recessed wall heaters	377,000	382,000	1.3%
Gas floor furnaces	161,000	146,000	— 9.3%
Gas direct heating equipment	1,470,000	1,545,000	5.1%
Gas unit heaters	(16 companies)		28.5%
Gas incinerators	(13 companies)		39.7%
Gas hotel and restaurant equipment	(8 companies)		12.9%

*Excluding built-ins

FROM the viewpoint of the gas appliance and equipment manufacturers, 1956 promises to be even better than the record performance of 1955, with spectacular possibilities in comparison with sales of other post-war years.

The reason for their optimism is evident in closing the books on the season just past, probably one of the most successful years for the entire gas and pipeline industry. The total number of residential gas customers reached 34,644,900, with gains registered by utility gas of 947,900 (3.7%) and by L. P. gas of 400,000 (5.4%) over 1954 totals.

Further good news was evident in the AGA survey, which advises that gas utilities expect to add 1.2 million new central and space house-heating customers during the coming year. This makes it well within the industry's reach to surpass oil during 1956 as the nation's number one central heating fuel.

A look at the prospects for the different appliances shows that while domestic gas range manufacturers look for 1956 to be only slightly better than was last year, this thinking relates only to their "free-standing" models. Built-in gas ranges have hit the market with a tremendous impact, and during the coming year could carry over-all gas range sales to a point well above last year's volumes. For the LPG dealers, the built-in units offer most attractive possibilities in sales to the new suburban housing developments.

Of the so-called "new" gas appliances, the clothes-dryer and the incinerator are already at the stage of accelerated rises in the sales curve with no doubt that new records will be reached long before the end of the year.

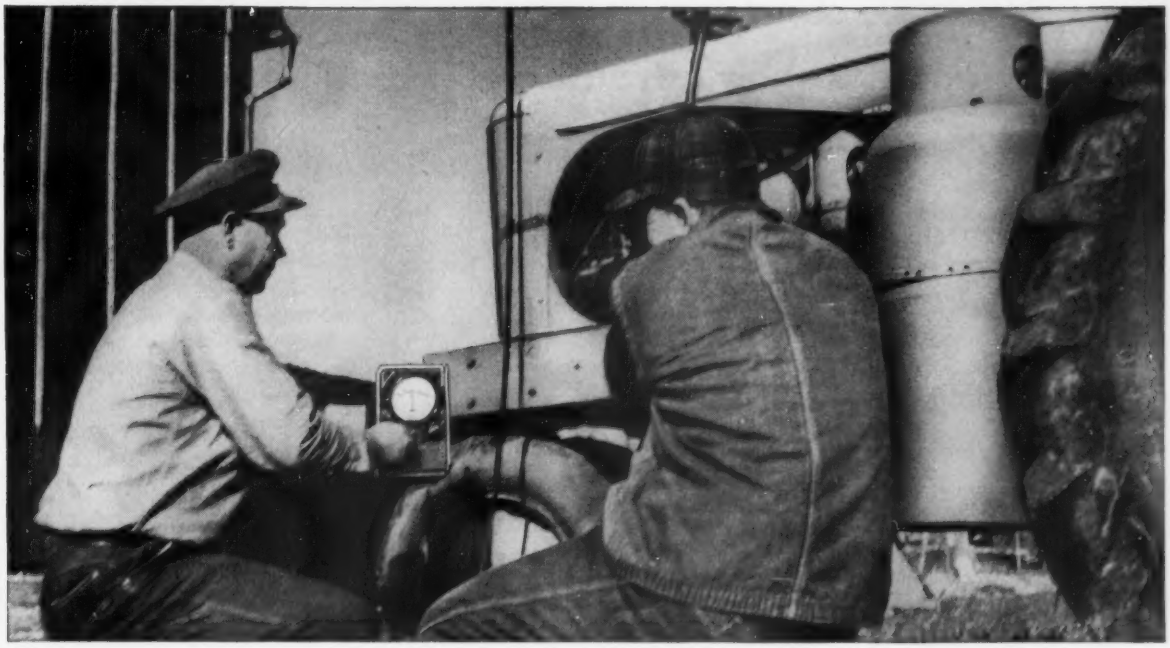
Backed by closer cooperation between industry groupings, by sound and continuing public relations and advertising programs, and by improving merchandising practices, the gas market has added over 15 million new customers since 1941. These aggressive policies promise a further broadening of the market in the future, for the potential in both new and old homes, and for industrial, agricultural, and commercial uses is still enormous. ■

Stevens Point has propane standby on city water system

THE people in Stevens Point, Wis. (population, 16,600) are not going to be caught short of water. Their city utility department has installed two propane-operated standby engines which can be clutched in on a moment's notice to drive the municipal pumps whenever the electric current fails—which it sometimes does.

These engines include a 225-hp unit which was originally operated on gasoline, but was later converted to propane by application of an Ensign carburetion system. It was not considered necessary to raise the compression or cool the manifold on this engine because its horsepower on propane is adequate and its annual use is not sufficient to make fuel economy important. It would take several years to save enough on fuel consumption to pay for these engine changes. The other engine develops 150 hp, and was equipped at the factory with an Ensign propane fuel system.

Fuel for the operation comes from a 1000-gal. tank on the premises. This large reserve has never yet been needed, but it is there in case a major disaster to the electric line should interrupt the current for several days. As fuel is used by the emergency engines, the tank is refilled by the Dri-Gas Co., which operates a bulk plant in Stevens Point. ■



Cities Service Distributor converts 200 tractors to LP-Gas!

Midwestern Butane Gas Company, Belleville, Illinois, sells half its propane for other than home use.

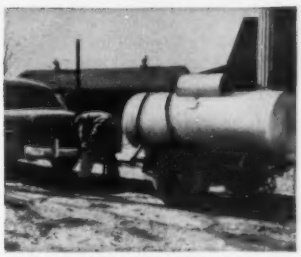
IN ONE HOUR, they convert a tractor to LP-Gas! They've already done it over 200 times.

But the men from Midwestern Butane Gas Company haven't overlooked other rich markets. Half their propane sales are for other than home use: Lumber mills, bakery ovens, orchard sprayers, quarry machinery—these and more are part of their growing market for Cities Service LP-Gas.

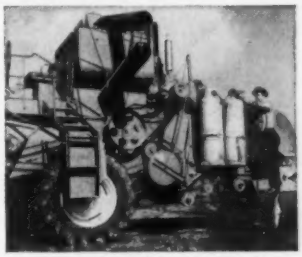
"We use Cities Service because we can always count on excellent quality, delivery, and on-the-job assistance," says Vice President Andrew Urban.

"Here's an example of that assistance: When I opened my new equipment store, three Cities Service representatives were on hand to help. And when I was called out, these men actually ran the store . . . spent hours explaining propane to my customers. What's more, they analyzed equipment conversions with the Cities Service Power Prover and provided tangible proof of the economics of using LP-Gas."

This is one of a series of outstanding reports from LP-Gas distributors, all praising Cities Service. To get the full story, call or write any of the offices listed below.



USEFUL INNOVATION is this propane tank mounted on trailer which enables farmers to keep fuel with them on the job.



LARGE SELF-PROPELLED COMBINE is one of many pieces of machinery which Midwestern has converted to Cities Service LP-Gas.

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QUALITY PETROLEUM PRODUCTS

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6611 Euclid Avenue, Cleveland, Ohio

MEMBER LPGB

German tests show advantages of cooking with LPG

ONE pound of propane gas used in cooking does the work of 4.3 kwh of electricity. This is the information being passed along to German housewives following tests recently conducted by the German Institute of Nutrition Techniques "regarding the economy and usefulness of liquid gas and electricity in rural households."

The German study, conducted in and near Stuttgart produced results in sharp contrast with those reported in Technical Bulletin No. 1073, issued by the U. S. Department of Agriculture, and which claimed that a pound of propane gas equaled in energy only 3 kwh. It bears out the assertion of BUTANE-PROPANE *News*, national and state gas associations, and leaders in the industry that the Beltsville findings led to inaccurate and misleading conclusions.

While the U. S. report sidestepped the matter of relative costs and drew its comparisons of the two fuels in such a way as to require extensive calculations to determine which was the most economical, the German study used a kilogram and kilowatt basis for measuring their effectiveness, these being the units used in buying gas or electricity in Germany.

In effect the report pointed out that it was up to the home owner to decide whether it was more advantageous for him to buy one kilo of liquefied petroleum gas or 9.5 kwh of electricity.

The German study was supervised by Dr. Elfriede Stuebler, head of the Research Institute for Domestic Economy of Stuttgart, as a special research project for the Institute of Nutrition Techniques, and was undertaken for the purpose of providing accurate information as to the amount of liquid gas or electric current required for cooking in the average rural German home.

With typical German thoroughness, the tests were not confined to a laboratory, but were conducted also in rural kitchens. Carefully kept records proved that liquid gas saves time in cooking and that the women in whose homes the tests were made had no difficulty in operating gas ranges although they were entirely unfamiliar with them. "The training period of the gas ranges was either astonishingly fast, or preliminary knowledge was not required to obtain favorable results," the report says.

Since the study was undertaken for the purpose of giving information to "all those interested in the reorganization of domestic economy in Germany," but particularly to serve as a guide for rural housewives, the tests were arranged to conform with the demands that would be made upon either type of range in the average home.

Sybille Pesche and Karl Schetche, who were assigned to the project—one to see that identical meals were prepared on each type of stove and the other to keep close watch on and to record the actual consumption of gas or electricity — prepared menus for an entire week, representing the quality and quantity of food normally consumed by a family of six and with a content of 3000 calories per person daily.

As the automatic water heater, generally used in this country, is not a part of the usual rural home there, water for cleansing dishes and for other purposes is heated on the kitchen stove. Therefore in addition to the preparation of the meals, a specified amount of water was heated after each meal and to a specified temperature.

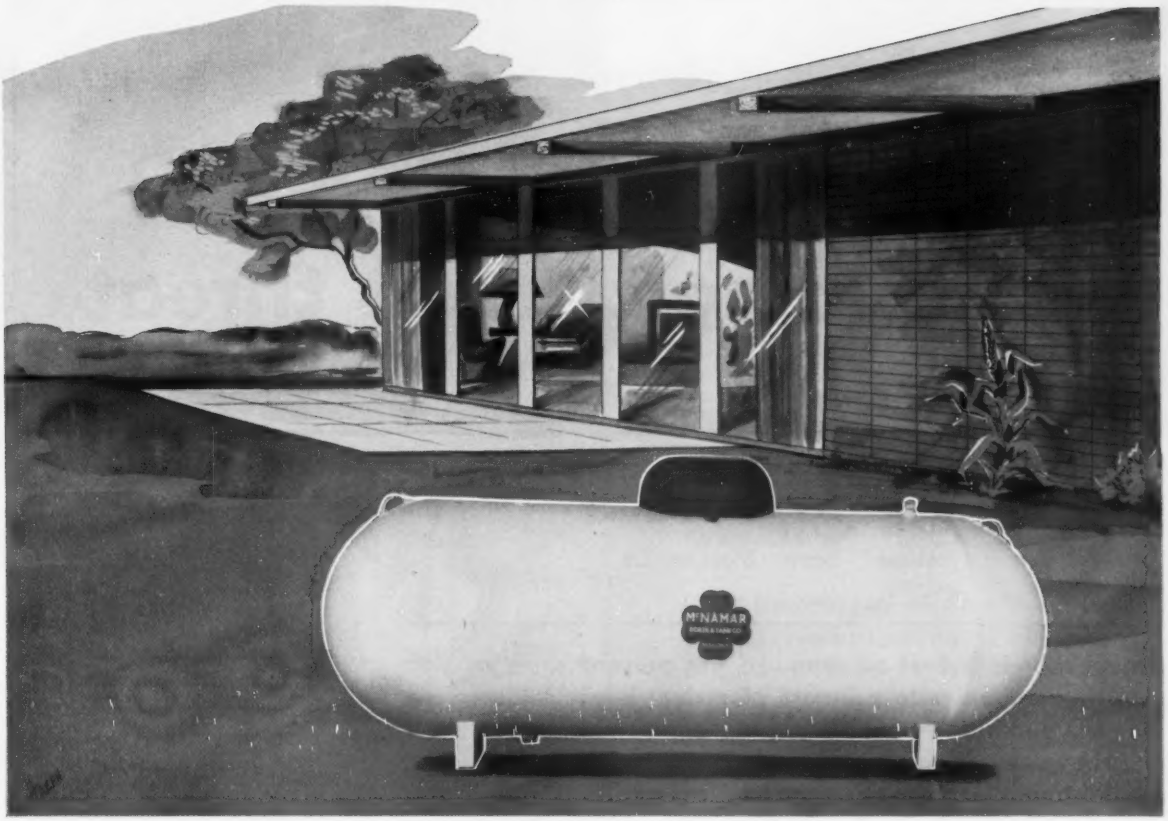
The tests were made first in the institute laboratory and later repeated in the kitchens of homes nearby and in which special ranges of each kind had been installed. In both, particular attention was paid to the amount of time consumed in the cooking, because as the summary points out, the rural housewife has many outdoor chores to look after. The menus were varied, however, for "on days when extensive work inside the home is necessary, long cooking meals, not demanding much close supervision, are preferred and both facts were taken into consideration in outlining the menus.

In the operation of the electric ranges special attention was paid to the utilization of "stored" heat, and "sequence cooking" was arranged in order to save electric energy — a bothersome detail not necessary on the gas ranges on which simultaneous cooking of entire meals was easily accomplished. This was an important factor in the time saving shown for gas. This difference could have been reduced by simultaneous cooking on the electric ranges, but would have increased the current consumption.

In spite of their unfamiliarity with gas ranges, women who cooked on them in their homes used only 3.7% more fuel and only 2% more time than were consumed in the preparation of identical meals, gas cooked by domestic science experts in the laboratory. "On the other hand," says the report, "the use of electric ranges showed considerable differences," it having been noted that housewives cooking electrically used 16% more time and 5.9% more current than the experts.

The report leaves no room for doubting that cooking can be done more quickly by L. P. gas than by electricity. Records for an entire week, during which the same meals were prepared on both types of ranges, showed that gas users saved two hours, an estimated time advantage of 10% over those operating the other type. "The consumption for gas cooking is especially favorable with meals requiring from 20 to 40 minutes to prepare," says the report, "for on such meals a time reduction of as much as 38% was recorded."

The Stuttgart report closes with the statement that the average amount of current consumed by the four electric ranges used in the test, came to 34,347 kwh, as compared with the average weekly consumption of the gas ranges of 3621 kg. It points out that the ratio of gas to current figures 9.5 which, reduced to American measurements, means that 1 lb of L. P. gas is equal in cooking energy to 4.3 kwh. ■



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Never before has any LPG Products Manufacturer been able to offer such quality tanks at such a reasonable price. The new McNamar Propane system is designed and equipped to take the rugged every day uses of modern home makers.
To create more sales in today's market, deal with McNamar for the most modern equipment available.

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TULSA, OKLAHOMA

Electric heating is becoming a REAL threat

A. J. Becker
President, Becker Marsden Co.

Mr. Becker is a fuel oil man. In the present drive of the electric companies to promote electrical house heating he sees the beginning of a real battle against his industry — and the enemy is gaining ground. The moral to the L. P. gas dealer should be obvious — the battle is against our industry also. No matter how ill-suited we consider electricity for house heating, many customers don't see it in the same light.

AN electric utility, to justify its investment in generating plants and distribution system, must have a reasonably balanced load throughout the year. If it is called upon to supply twice as much electric energy during three months of the summer as it can sell during the other nine months of the year, it becomes difficult to show a satisfactory return on invested capital. To meet such a situation it has only two alternatives—either obtain higher rates generally, which tend to discourage the use of power-consuming devices, or build up a winter load to equalize the summer peak. The latter, of course, offers a far more desirable solution. Almost the only winter load available which would meet the issue is a househeating load. A utility cannot expect to acquire such a load unless it offers rates which bring heating costs within reach of the average home owner. A *kilowatt-hour rate for househeating lower than the general rates would thus have to be offered. This is exactly the development which is now taking place in some markets, and will unquestionably expand to others.*

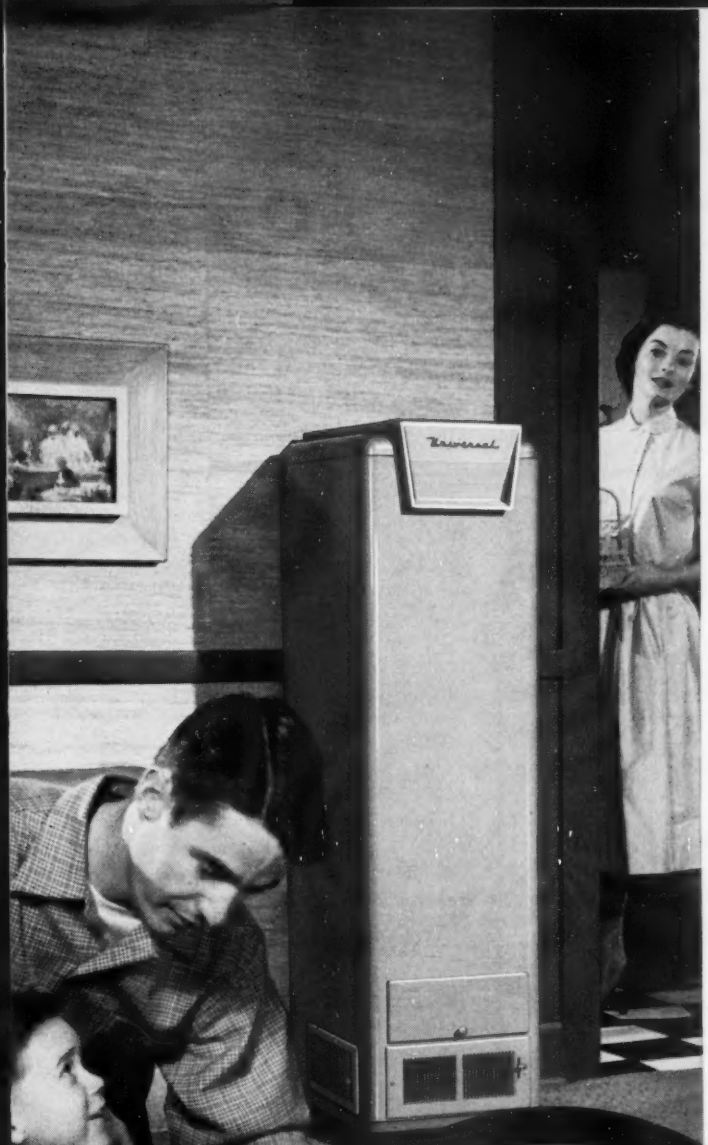
A subsidized example

As an indication of what may happen in any market when electric heating rates become attractive, let's take a look at a highly developed electric heating market in the Tennessee Valley. In Chattanooga the househating rate is ¾ cent per kilowatt-hour. For comparison, this rate in most larger cities ranges from 1½ cents to 3 cents per kilowatt-hour. Fuel oil in Chattanooga is 14 cents a gallon. At those fuel costs, assuming an efficient installation for electric heating and an average efficiency for oil heating, costs for electric heat would be 24% higher than for oil heat.

"In Chattanooga, 29% of the homes are heated with electricity; 90% of the new homes are so equipped. Chattanooga also has 250 commercial and industrial electric heating installations. . . . Electric heating grows in proportion to the pressure put behind it by the electric company."

The Chattanooga utility, however, insists upon 6 in. of insulation in roofs, 3½ in. in walls, and 2 in. under floors. After the home owner has spent the money to accomplish that, the claim is made that heating costs with the two fuels are just about equal. It must be added, of course, that the same amount of insulation with oil heat would reduce the oil costs at least 15%. The point is made that, with direct electric heat in the rooms, the saving through insulation is greater for electric heat than for oil, because the insulation has no effect upon stack and duct losses which are a part of the conventional warm-air oil-burning installation.

At best, then, with equal insulation, electric heat in Chattanooga costs at least 15% more than oil heat. The facts of the case are, however, that 29% of the homes in Chattanooga are heated with electricity, that 90% of the new homes are being so equipped. Chattanooga also has



Now . . . offer central heating comfort at "space heater" cost!

New Universal ends off-and-on heat blasts . . . guarantees your customers constant floor-to-ceiling comfort!

If there's a market for "space heaters" in your area, there's a many times bigger one for the revolutionary new Universal *Constant Comfort* Gas Heater. Because here, for the first time in 20 years, is an entirely new and efficient home heater principle that ends cold drafty floors and hot ceilings.

Constantly circulates warm, filtered air all over!

Just like the most costly modern central heating systems, the new Universal *Constant Comfort* Gas Heater continuously circulates warm, filtered air all over the rooms at all times. It automatically maintains even temperatures from floor to ceiling. Yet it actually costs *less* than some ordinary "space heaters," requires no additional installation and lowers fuel costs by re-circulating preheated ceiling air.

Act now on this big profit opportunity!

There's already a fast-growing demand for heaters in motels, house trailers and many other *new* locations. Now Universal's many revolutionary new features will open a huge new replacement market in homes, businesses and other locations where heaters are in use.

Don't delay. Rush the coupon for complete details today—plus news about the consistently powerful promotion program that will *move* Universal *Constant Comfort* Gas Heaters right off your floor!

the new *Universal*

CONSTANT COMFORT GAS HEATER

for LP or city gas

Never before a **GUARANTEE** like this!

Cribben and Sexton Company guarantees the Universal Constant Comfort Gas Heater (when used in proper size for space to be heated) will outperform any heater now sold in maintaining constantly comfortable temperatures from floor to ceiling.

Products of Cribben & Sexton

Universal Gas Ranges

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Gentlemen: Please rush complete information about the special money-saving advantages of placing my Universal Constant Comfort Gas Heater order now.

your name_____

firm name_____

street address_____

city_____ zone____ state_____

Electric heating... The idea of electric heating strikes a responsive chord with many buyers

250 commercial and industrial electric heating installations. This market is a good example of the fact that electric heating grows in proportion to the pressure put behind it by the power company.

The average of all residential consumers in Chattanooga shows a usage of 8143 kilowatt-hours per hour. In Memphis, where electric heating has been frowned upon by the utility as being too expensive for the average consumer, this figure is only 2435 kilowatt-hours. In Nashville, where utility pressure on builders has been heavy, 80% of all new homes are being electrically heated. The Knoxville utility promotes gas for heating, but sells electricity for heating 85% of the new homes.

The overall Tennessee Valley picture sums up to the following: in 1944, 950 electric homes; in 1954, 100,000 homes so heated—this in spite of the fact that the cost of electric heating is in many spots 40% higher than oil heating. Growth has been stimulated by good promotion by power companies and by advancing prices of other fuels.

A competitive example

Now let's take a look at a market which does not enjoy the blessings of the government subsidized rates of the Tennessee Valley. Tulsa, Okla. is a city which really needs summer cooling. In recent years it has gone hog-wild in acquiring it—to such a degree, in fact, that the Public Service Co. of Oklahoma has launched a $40 million expansion program to add 400,000 kilowatts of new generating capacity. Its summer monthly residential peak demand increased from 187 million kilowatt-hours in 1953 to 282 million kilowatt-hours in 1954—increase 51%. At the same time its winter monthly average demand increased from 130 million kilowatt-hours in 1953 to only 140 million kilowatt-hours in 1954—an increase of less than 8%. It has a problem for which there appears only one answer—an offsetting winter residential heating load to balance its summer demands.

It has been driving hard to acquire such a load with a 2½-cent kilowatt-hour rate. On that basis, customer bills are too heavy, even with a heating load of only 3050 degree-days. Natural gas offered at 40 cents per 1000 cu ft is tough competition. This utility has now petitioned the public service commission for a heating rate which drops to a minimum of 1 cent per kilowatt-hour, and under which it is estimated that the average heating rate will be 1.1 cents per kilowatt-hour. At those rates gas and oil have a decided cost advantage; but, with a strong publicity and merchandising program, this utility will build a sizeable winter load if distributors of other fuels merely sit back and let it take over part of the market.

"In Tulsa, the electric utility has now petitioned the public service commission for a heating rate which drops to a minimum of 1 cent per kwh. At those rates, gas and oil have a decided cost advantage; but with a strong publicity and advertising campaign, this utility will build a sizeable winter load if distributors of other fuels merely sit back and let it . . . "

This Tulsa picture points up the crux of the whole situation—a power company with such an unbalanced load, as a result of summer air-conditioning demand, that it is willing to drop its heating rate from 2½ cents to 1.1 cents a kilowatt-hour in an effort to equalize its winter-summer sales. The problem is, perhaps, not quite this critical in many cities at the moment, but the trend is strongly in that direction—and in time the same sort of relief will undoubtedly be attempted in many other markets. It will not be necessary to offer power at rates equal to the cost of other fuels to make electric heating a real competitor. The very idea of electric heating strikes a responsive chord with many buyers; and, when costs come within the reach of the average home owner, good promotion will sell many electric heating installations.

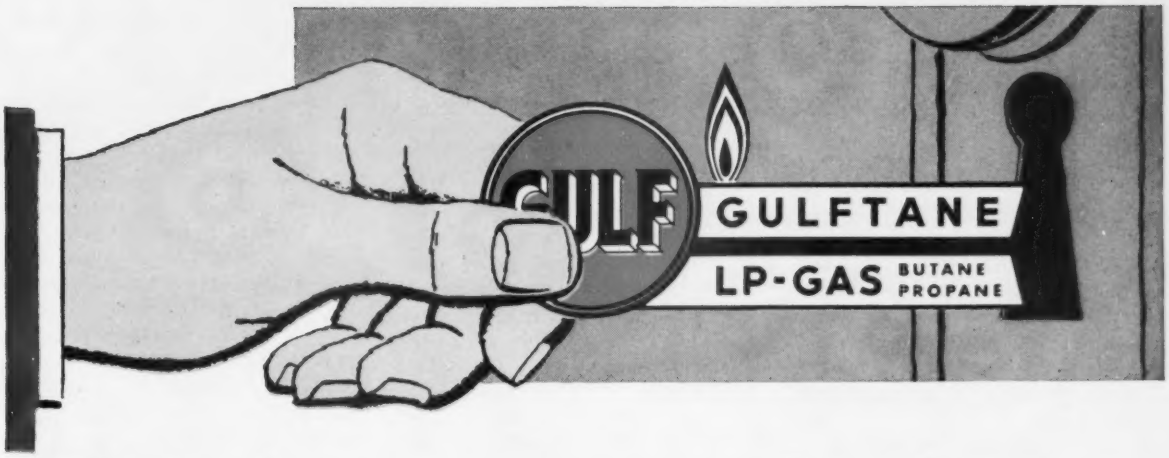
Northern markets

Has electric heating made progress in the more northern states? Yes, in the state of Indiana there are some 1200 electrically heated homes. Some 200 of these are in Indianapolis, where they have a 1.7-cent heating rate. The greatest concentration of such installations is around Fort Wayne, where the heating rate is 1½ cents per kilowatt-hour. Canton, Ohio, has 400 electrically heated homes on a 1½-cent rate.

In Three Rivers, Quebec, where the heating load is 8073 degree-days, electric wall-panel heating has been installed in 38 double duplex units comprising 150 dwellings. The power rate there is 1.6 cents per kilowatt-hour. The claim is made that the upper dwellings—comprising a living room, kitchen, and 3 bedrooms—heated for an average annual cost of $122. The lower dwellings, which include in addition a heated basement, averaged $166. An interesting sidelight on this installation is the claim of the supplier that no more heating capacity is required at —20° than at 5°; reason: no wind, and invariably

"In Darien, Conn., a distributor specializes in selling electric wall panels for bathrooms, sunrooms, hard-to-heat rooms, and the like, and considers this a means of getting a foot in the door to establish the electric heating idea. He hopes that in time more favorable power rates will create an extensive homeheating market."

Presented at a meeting of the Division of Marketing during the 35th annual meeting of the American Petroleum Institute in the St. Francis hotel, San Francisco, Nov. 14, 1955.



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Here are three good reasons why it will pay you to buy Gulftane LP-Gas:

1 High quality—Gulftane is produced in plants of the latest design under accurately controlled conditions to specifications that meet the highest standards adopted by the LP-gas industry. It is free of moisture, gum, tar, dust, dirt, and sulphur. Or, to put it another way, Gulftane is the same high quality as Super-Refined No-Nox Gasoline and the other well-known products that carry the familiar Orange Disc trade mark.

2 Dependable supply – many natural gasoline plants and refineries, plus adequate storage, assure reliable, continuous supply.

3 Prompt delivery service—modern Gulftane producing plants strategically located throughout Gulf's wide-spread marketing territory, along with a fleet of new tank cars, assure prompt, efficient delivery service.

Also ready to serve you is Gulf's experienced engineering and marketing personnel. Get all the facts concerning Gulftane service—contact your local Gulf District Office or your nearest Gulf Division Sales Office (see addresses below).

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P. O. Box 1679
Denver 1, Colo.
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GULF OIL CORPORATION
GULF REFINING COMPANY
1822 Gulf Building, Pittsburgh 30, Pa.

Electric heating... Oil has long been associated with something that is dirty and scummy

brilliant sunshine at sub-zero temperatures.

In Darien, Conn., a distributor specializes in selling electric wall panels for bathrooms, sunrooms, hard-to-heat rooms, and the like, and considers this a means of getting a foot in the door to establish the electric heating idea. He hopes that in time more favorable power rates will create an extensive home-heating market.

St. Louis

In St. Louis the power company saw the possibilities in a summer-cooling load 20 years ago, and actually pressured refrigeration manufacturers to produce equipment which could be used for space cooling. Today St. Louis is one of the most completely summer air-conditioned cities in the country.

The total residential market, however, has barely been scratched. For several years Union Electric Co. there has succeeded in balancing its load to such a degree that its peaks in August and in December have always been beaten by the succeeding peak. It has a househeating rate of 1¾ cents per kilowatt-hour. The company is strongly promoting electric heating, and sees no need at this time to request a special winter-heating rate to balance its load. When summer cooling has progressed to a point where a larger percentage of homes is completely cooled, it is probable that this balance will be destroyed.

At present the company is fortunate in having a heavy winter commercial demand which balances its also heavy summer air-conditioning load. Before summer cooling came into the picture, the summer demand was only about half the winter load. At its rate of 1¾ cents per kilowatt-hour, this power company supplies the electric energy for heating 650 homes in St. Louis and the surrounding suburban district. Cost is three times that of heating with oil.

Many additional examples of the development of electric heating above the Mason Dixon Line could be cited. The examples given illustrate a trend. In each of these cases electric heating is being sold on a basis of heating costs more than double those of doing the same job with fuel oil. These people are, of course, the pioneers. They want electric heat enough to pay the difference. Picture how many more people would do likewise if electric heat were available at say 35% over the cost of oil heating!

In general, in the state of Washington, most power companies do not consider heating a good load because it creates a high winter peak for which there is no offsetting summer load. Their problem is apparently exactly the opposite of that in such areas as Tulsa, Okla. In spite of this attitude, low power rates there are building an electric heating load. The Oil Heat Institute of Washington has launched an extensive advertising program to sell the oil-heat idea. This campaign is prompted, in part, by anticipated competition from natural gas, in the not too distant future. It is interesting to note that this campaign is credited with being largely responsible for reducing to a trickle the number of electric heating installations in many districts—this in some areas where electric installations were going in at an alarming rate two years ago.

"A recent survey in Seattle to determine attitudes of home owners toward the various fuels . . . discloses . . . of 500 home owners, 90% heat with oil and almost 80% have central heating plants. More than 20% of these people indicated a preference for electric heat, notwithstanding the fact that there has been no pressure campaign to sell electric heating in Seattle."

A recent survey in Seattle to determine attitudes of home owners toward the various fuels, in preparation for this campaign, discloses some interesting information. Of the 500 home owners interviewed, 90% heat with oil, and almost 80% have central-heating plants. More than 20% of these people indicated a preference for electric heat, notwithstanding the fact that there has been no pressure campaign to sell electric heating in Seattle.

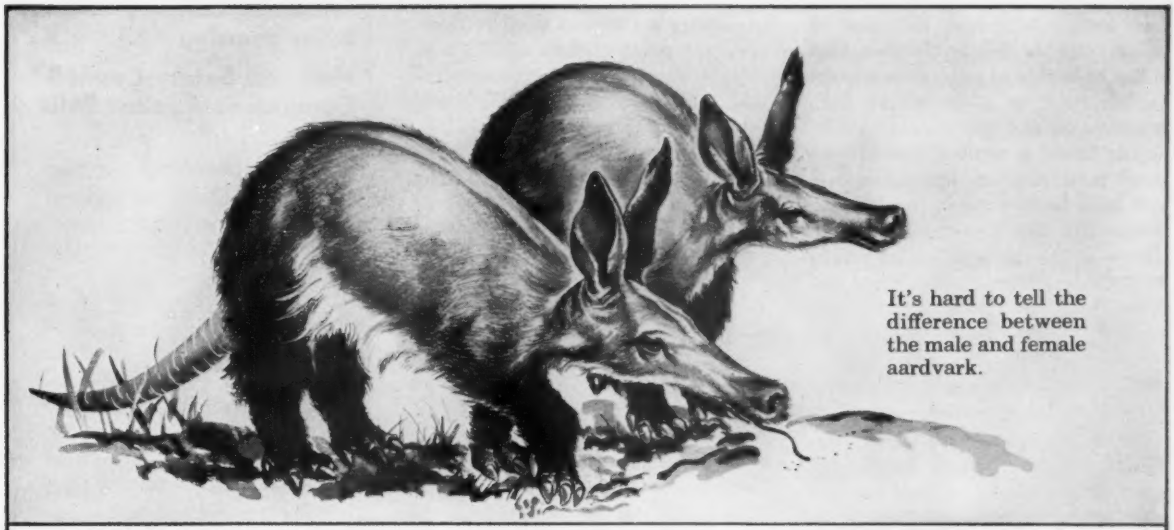
The principal disadvantage of oil heat cited by these 500 home owners was that it is dirty and leaves an oily scum, whereas they cited cleanliness as the principal advantage of gas and electric heating. A similar survey conducted in St. Louis in 1949 brought out those very same consumer beliefs. The very word "oil" is associated, apparently, in the minds of many people with something which is greasy, dirty, and scummy. Pictures of clogged oil strainers, in advertising designed to sell some particular brand of fuel oil, have not helped this belief. It would seem apparent that the oil industry needs forcibly to bring home to the public the truth about the cleanliness of oil heating, through general and extensive advertising.

Oregon

The Oil Heat Institute of Oregon recently completed a survey in 11 principal market areas in western Oregon. In four of these markets electric heat serves 22 to 32% of the single-family dwellings. In four others it has 7 to 9½% of the same market. Portland is predominantly oil-heated, and its citizens indicated a strong preference for that fuel. In a number of the other markets where oil heat predominates, however, consumers indicated a preference for other fuels—in most cases electric heating. Here, again, 41% of the consumers interviewed felt that oil heat is dirty.

Perhaps the most important point in the summary by the research organization which conducted the Oregon survey is the statement that the fuel about which oil heat should immediately be most concerned is electric heat.

It points out that electricity is making inroads in every market where it



It's hard to tell the difference between the male and female aardvark.

But the difference is obvious when you make up a Rockwood Union.

Hardness Differential means . . .

No galling in make up!

The male seat of the new Rockwood Union #603 is specially heat treated to make it 150 Brinell harder than the female seat. This hardness differential is the reason there's no galling in make up and longer life for the joint.

Even under difficult working conditions, Rockwood Union #603 gives you superior performance. And each part of the #603 is interchangeable.

There's another big difference that pays off, too! That's exclusive "Rockwoodizing" process that protects the entire Union including threads, against corrosion. Add these big advantages to the fact that both seats are made of corrosion-resistant AISI molychrome steel, forged in place and bonded-locked under 100,000 and 400,000 pound pressure and you'll know why you can't buy a better Union.

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Please send me prices and further data on the new Rockwood Union #603. I would also like the name of the nearest Rockwood distributor.

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City.....Zone...State.....

has been established, and that it gains extreme loyalty; further, that it has been able to some extent to establish itself as a distinctive fuel, whereas oil and gas remain in consumer thinking as no different from other fuels. Heaviest inroads in Oregon have been made in the markets where low-cost power is available. These, in the main, are areas served by public-utility districts. These districts, organized under the philosophy of the previous administration, are given preferential treatment; and, as they pay no taxes, are able to offer power at low rates.

Rates in those markets where electric heating has greatest acceptance range from ½ cent to 1.1 cents per kilowatt-hour. In almost every instance, however, there is a higher penalty rate which discourages home heating. Competition from privately owned utilities is not so serious. Fantastic claims of economy of electric heating by not-too-reputable appliance dealers in some areas have been implemented by the public-utility district, but generally refuted where private utilities operate. One privately owned utility set out to capture a space-heating market in southwestern Oregon with a low power rate and aggressive selling. Once having acquired the market, it proceeded to put into effect five successive rate increases; result: substantial reconversions to oil heating. It is estimated that there are 27,000 homes in western Oregon heated with electricity. Climate in Oregon is not too different from that in Washington, and this is not likely to become a major market for summer cooling. The Oil Heat Institute of Oregon, incidentally, is organizing an extensive program to sell the oil-heat idea.

Heat pumps

Considerable progress has been made in the sale of electric heat pumps in the desert area of the southwest. Summer cooling is almost a "must" in this district; and, as winter temperatures rarely fall below 32°, these pumps are pretty much of a "natural" for these heating and cooling requirements. The heat pump, because of its relatively low initial cost, is destined to play an important part in the development of combined heating and cooling in many markets. Actually, a heat pump is nothing but a good sized refrigeration compressor (3-hp to 7-hp usually) with necessary valves and controls. How does it work? Well, you know how it cools—a low-temperature refrigerant absorbs heat from the house air, cooling the air and warming the refrigerant. Later, air blown across this hot compressed refrigerant, dissipates this heat to the outdoors. In heating, the process is just reversed. The same cold coil absorbs heat—now from the outdoor air —and the hot condenser coil gives up its heat to the air which heats the house. As the pump's heating capacity in winter falls off as the outdoor temperature drops, it is necessary, in northern installations, to add electric coils in the main house ducts for the purpose of supplementing in severe weather the heat output of the pump. Thermostatically controlled, these coils in most instances are called upon to function only a relatively small part of the season. Where a plentiful supply of low-cost water is available at temperatures of 60° F to 70° F, as is the case in parts of the southwest, this can effectively be used in place of air as an exchange medium for the heat pump. Higher output per horsepower and, accordingly, lower costs can thus be effected. The heat pump lends itself not only to combined heating and cooling of new homes, but also fits into the furnace-replacement market for the same service. The pumps cost about $1500 in St. Louis for a 3-hp unit to handle a 5-room house. This is exclusive of duct work and auxiliary heating coils.

It is not possible to cover in detail the current development of electric heating in all parts of the country in a paper of this length. What I have tried to set out are sufficient examples to indicate the general trend.

Now what does all of this add up to? What conclusions should we draw? It is apparent that electric heating becomes a competitor whenever rates are reduced to a point where costs are reasonably within the reach of the average home owner. It becomes a serious competitor when such rates are combined with aggressive promotion by a power company. Such rates and such promotions are likely to result whenever a power company finds it necessary to acquire a sizable increase in its winter load to offset a peak summer demand. ■

Safety Roundup

National Safety Council Campaigns Against Falls

THE National Safety Council will soon begin an intensive nationwide campaign to reduce accidental falls. The campaign will seek to reduce substantially the number of falls in all areas by focusing the attention of management and workers on this one type of accident.

The council has singled out falls for special emphasis because of their great importance in the total accident picture:

Falls account for more accidental deaths and injuries than any other cause, except traffic accidents.

Falls take a heavy toll of workers, ranking just after handling objects as the greatest source of disabling occupational injuries.

Falls are costly accidents. Falls from different levels frequently result in death or serious injury and compensation payments are substantially above those for other accidents.

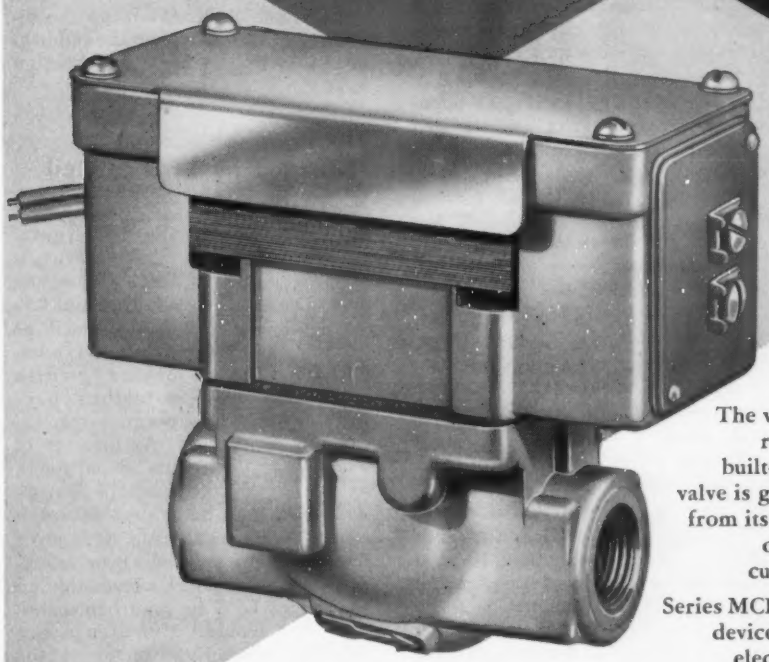
Falls account for more than half the injuries to office workers, according to a recent study of the U. S. Department of Labor.

In addition to their numerical importance, falls were chosen as a campaign target because most of them can be prevented by voluntary individual behavior. Most falls result from unsafe acts of individuals — running about unnecessarily, using makeshift ladders, rushing down stairs, failing to wipe up spills. A little extra caution and knowledge on the part of each person can do much toward the reduction of accidental falls.

Among the materials will be booklets, films, banners, posters, flip charts, 5-minute safety talks and safety instruction cards. For a sample booklet and a complete list of materials and prices, write the National Safety Council, 425 North Michigan Ave., Chicago 11, Ill.

FOUR NEW ACTROL® VALVES

provide positive, quiet, efficient control for your GAS appliances



The Actrol family of valves is designed for the gas appliance that needs a reliable, automatic main gas control valve—efficient, strong in opening and closing pressures, and simple to install and service. This proven line is now augmented by four new Series MC models, each available with ½" female pipe threads inlet and outlet.

The valve mechanism of all is actuated by a rotor turning in the magnetic field of a built-in transformer. Opening force of the valve is greatest when the valve must be started from its seat against gas pressure. All models operate on 115 volt, 60 cycle, a.c., line current with a 24-volt secondary circuit.

Series MCR has a manual set, automatic recycling device to hold valve open during periods of electric power failure; manual set releases when normal electric service is restored.

Series MCS includes a Baso® switch automatic pilot wired in series with the primary coil of the transformer and deriving energy from a thermocouple. It provides safe lighting.

Series MCV incorporates Baso valve and automatic pilot in one casting to provide safe lighting and complete shut off. Valve has two ⅛" F.P.T. pilot tappings, one on each side.

CAPACITY: BTU./HR. AT 1" PRESSURE DROP

ACTROL Series	Natural Gas	Mfd. Gas
MC	170,200	115,000
MCR	170,200	115,000
MCS	170,200	115,000
MCV	148,100	100,100

Investigate these compact Actrol valves and note the many positive product and sales advantages they have for your line of gas appliances.

MILWAUKEE GAS SPECIALTY CO.
Dept. SB-10
MILWAUKEE 1 • WISCONSIN

Council's '56 ads hit 21 million readers

This year, 40 magazines with a combined circulation of almost 21 million will carry L. P. gas industry advertising scheduled by the National LP-Gas Council.

Three new magazines just announced by the council reach important, specialized markets. *Small Homes Guide* and *Home Modernizing* have been added to reach a preselected audience of potential, immediate users in small towns and suburbs. *What's New in Home Economics*, national trade journal for home economists, is the third publication added to the 1956 schedule. In this magazine, the ads will aim at pre-selling school staff home economists on the convenience and efficiency of modern L. P. gas appliances and services.

Consumer advertising by the council will continue the "Did You Know?" cartoon series in farm and small town magazines, but a new ad style has been chosen for ads in shelterbooks.

Suburban market ads in *Better Homes & Gardens, American Home* and *Living for Young Homemakers* will accent photographs of modern, suburban homes. A subhead caption, "New Kind of Gas Service makes homes *more* modern," leads readers into copy about the luxury and convenience of automatic L. P. gas house heating. February, March and April issues of the big circulation magazines will carry the new ads.

To localize the national "Did You Know?" campaign, LPG uses popular in different areas are changed for publications reaching farm, small town and suburban markets. "Looseleaf" construction of the ads permits this "custom-made" feature in the ads to match regional and market uses throughout the country with circulation of publications concerned.

Other special advertisnig campaigns on the National LP-Gas Council schedule include ads in *American Mote, Farm Equipment Retailing, Implement and Tractor* and *Agricultural Leaders' Digest.*

Ranges, water heaters, clothes dryers, house heating and incinerators are promoted in the first quarter ads.

Sponsored by the Gas Appliance Manufacturers Association, Natural Gasoline Association of America and the Liquefied Petroleum Gas Association, the National LP-Gas Council promotion program is now in its sixth year.

Use of LPG in modern, suburban homes will be pointed up in this ad which will appear in American Home, Living for Young Homemakers, and Better Homes & Gardens.

New credit union pays first dividend

The first dividend of the newly organized Credit Union of Suburban Propane Gas Corp. has been declared. A 3% dividend, payable to shareholders of record as of Dec. 1, 1955 on shares outstanding of that date and not withdrawn prior to Dec. 31, was voted at the first annual meeting of the union, which was organized in February 1955.

The Credit Union's membership of 185 represents 92% of the total personnel in the Whippany, N. J., office. The wide acceptance of the plan in the general offices of the company is encouraging management to extend the program into its more than 80 district offices.

Tank truck carrier directory reissued

The second edition of the National Tank Truck Carrier Directory is now being distributed to subscribers by the publisher, National Tank Truck Carriers Inc.

Containing all of the information, brought up to date, that appeared in the first edition in January 1955, this directory also ineludes much additional information. Featured in the publication is a listing of for-hire tank truck carriers by states, including such information as their address, phone number, officers, sales representatives, terminal locations, etc.

Additional information on the directory is available from the publisher at 1424 16th St. N. W., Washington 6, D. C.

Homemaker service launched by LPG council

Lucille Range

A "Lucy P. Gavin" homemaker service is being launched the National LP-Gas Council as part of its expanded public relations program.

As director of the department, Lucille Range will work with home demonstration agents, home economists, newspaper feature editors and radio program directors to offer latest information on the use of LPG in suburban, rural, and farm homes. Miss Range was formerly publicity director of the Electric Association in Chicago.

The Lucy P. Gavin department will also serve as a clearing house for information concerning new features offered on modern gas appliances used with L. P. gas systems.

Water heater shipments off to good start

Shipments of automatic gas water heaters seemed on their way to fulfilling earlier forecasts when 226,700 units were shipped in January, continuing the record-breaking pace set last year.

According to GAMA statistics, January shipments were 7.5% greater than those of the same month last year. Edward R. Martin, GAMA's director of marketing and statistics, said this is significant since shipments for the full year of 1955

"Looking for more sales and profits?"

You can boost those slumping warm weather sales with these DAL-WORTH units designed to make the switch to complete LP Gas farm operation more convenient . . . more economical.

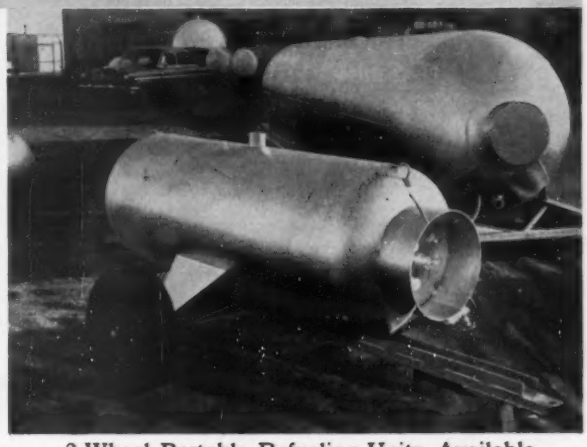
DAL-WORTH portable LP gas tanks eliminate the loss of time for moving lumbering equipment to a refueling point. The 2-wheel unit can be in place and equipment refueled in a matter of minutes.

The 4-wheel anhydrous ammonia tank offers the additional feature of quick conversion to a simple trailer unit for miscellaneous hauling.

You can sell these units with the assurance that your customer is getting the finest equipment money can buy . . . backed by over a quarter century of experience and the DAL - WORTH "CERTIFIED CONSTRUCTION" SEAL.

Whatever your needs . . . on the ground, on skids, or on wheels . . . you'll do best to come to DAL-WORTH!

Send for Dal-Worth's newest catalog of quality engineered LP gas and anhydrous ammonia tanks . . . the coupon is for your convenience.



2-Wheel Portable Refueling Units. Available in 250-gallon and 500-gallon capacities.

4-Wheel Portable Anhydrous Ammonia Tanks. 500-gallon and 1000-gallon Capacities.

DAL-WORTH TANK COMPANY

East Highway 80 — P. O. Box 818

Grand Prairie, Texas

DAL-WORTH TANK COMPANY
BOX 818, GRAND PRAIRIE, TEXAS

Gentlemen:
Please rush us your latest catalog describing DAL-WORTH'S "Certified Construction" tanks.

Company_____

Att'n:_____ Title_____

Address_____

City_____ State_____

set an all-time record of 2,748,200 units and because 30 out of 37 water heater manufacturers already have predicted increases for 1956 which could put the industry about 10% above this total—passing the 3-million mark for the first time.

Trinity begins new chapter in growth story

When Trinity Steel Co. moves into its new Dallas plant next month, this pioneer LPG tank-building firm will be starting a new chapter in a story of phenomenal growth. In the past 20 years the company's business has increased 5000%, the number of employees has jumped to 130.

The growth of Trinity has paralleled the rapid growth of the LPG industry itself, and the new plant, with its 65,000 sq ft of working space, will be a far cry from the small space occupied in downtown Dallas a score of years ago.

The new building is located in a 15-acre tract at 4001 Irving Blvd. in the heart of one of Dallas' most modern industrial areas. It will be of steel construction. An adjoining masonry building with 5000 sq ft of floor space will house the general offices of the company.

C. J. Bender, the man who spearheaded the rapid growth of Trinity and its president and founder, was first associated with the LPG industry back in the days when domestic tanks were hand-welded by independent plate fabricators and the systems assembled by individual companies.

The building is equipped with overhead cranes and conveyors. The assembly-line method of producing LPG tanks and tank trucks permits closer supervision and inspection, thus eliminating the need for additional personnel.

Beaird expands, buys Butler's LPG division

J. B. Beaird Co. Inc., Shreveport, has purchased the L. P. gas system division and manufacturing facilities of the Butler Manufacturing Co. at Galesburg, Ill.

According to the announcement from J. Pat Beaird, president of the Shreveport firm, the purchase is effective April 2. It includes all raw materials and finished goods inventories of the Blue Belle system as well as assumption of Butler's standard products warranty and all manufacturing rights to the Blue Belle system.

Glenn A. Speakman, Butler vice president, and J. Pat Beaird, president of the Beaird company, sign the purchase agreement which completes the sale of Butler's L. P. gas system division facilities to Beaird.

Mr. Beaird also announced construction of a new manufacturing plant, utilizing Butler equipment plus the most modern machinery available for producing LPG systems in the Galesburg vicinity.

He pointed out that the acquisition is a further step in Beaird's expanding program to develop production and distribution centers in the heaviest areas of consumption for the growing LPG industry. Mr. Beaird pointed out that his company established a manufacturing plant for LPG systems for the West Coast in Stockton, Calif. two years ago.

The midwestern plant will add new scope to Beaird's five integrated divisions whose products are sold on an international scale under the direction of J. L. Tullis, vice president and general manager of sales.

Beaird's supply and service of L. P. gas systems will be greatly strengthened and speeded by this new plant, centered in one of the country's fastest growing areas in L. P. gas use, Mr. Tullis said.

Coordination of Butler's heavy midwestern distribution into Beaird's nationwide sales organization will be handled by Richard M. Meisenbach, manager of LPG and NH-3 equipment sales.

Among Beaird products used in the processing, transport or consumption of liquefied petroleum gas are pressure storage vessels up to 75,000-gal. capacity for refineries, dealer storage tanks up to 30,000-gal. capacity, single and twin tank Payliner transports for dealer's distribution, complete filling stations for vehicles using L. P. gas as motor fuel, and domestic systems from 60- to 1150-gal. capacity.

Beaird packaged compressor plants and cast steel fittings for refineries also are utilized in the manufacture of LPG.

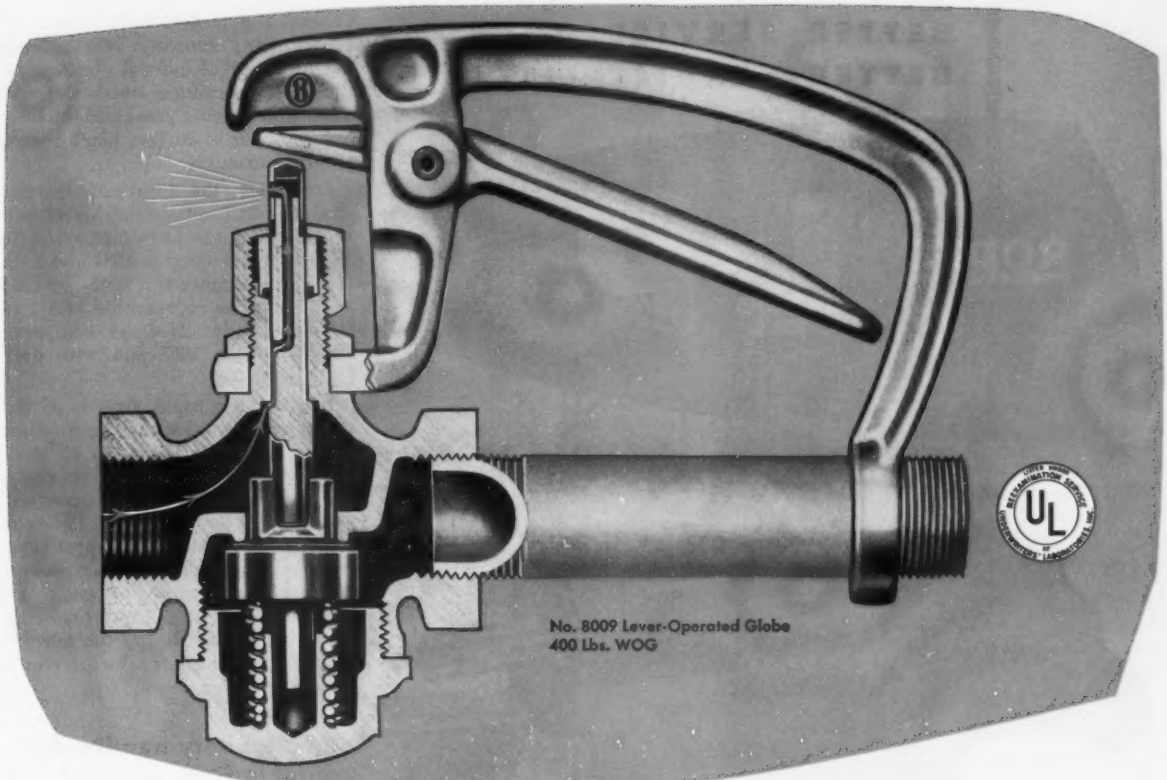
Top Trinity Steel executives are (from left) Ray Reed, vice president and sales manager; W. Ray Wallace, executive vice president; C. J. Bender, founder and president; W. N. Peacock, chief engineer and head of research department; and E. M. Mancell, secretary-treasurer and office manager.

Phillips' '55 gross income reached $900 million

Last year the Phillips Petroleum Co., which pioneered the mass marketing of liquefied petroleum products, had a gross income of $900 million, with a net income of $93 million, and this year looks for sales to pass the billion mark, with a profit of $100 million. Dividends paid last year to the company's 90,000 stockholders totaled $47 million—$3 per share.

These are some of the many interesting facts set forth in a comprehensive and interesting analysis of the company's past achievements and future possibilities, prepared by Shearson, Hammill & Co., member of the New York Stock Exchange, and recently published in an attractive brochure being distributed by the Phillips company.

Now the eighth largest company in the industry, Phillips, the analysis says, is the recognized leader in four rapidly growing phases of the industry. It is the leading domestic producer of natural gas and is believed



It's new!

An LP-Gas Valve with safeguard design – Listed by Underwriters Laboratories

Now you can have increased protection when transferring liquefied petroleum gas from tank to tank.

This lever-operated, bronze dispensing valve is especially designed for safe operation. It minimizes the hazard from gas trapped in the line after a tank is filled and the tank valve closed. Back pressure can escape in only one direction . . . *away* from the operator's hand. It goes through a special escape port in the stem of the dispensing valve.

Available in three sizes — ½, ¾, 1-inch — the No. 8009 dispensing valve is listed by Underwriters' Laboratories. In testing, it was still leaktight after 10,000 operations.

Companion line to the No. 8009 is the No. 8001 bronze globe valve. It has the sturdy outside bonnet design, features the slip-on disc holder to make disc changing a matter of only a few minutes. Available in sizes ⅛″ through 3 inches, rated at 400 pounds water, oil, or gas pressure.

Both valves are made by a company that has been making quality bronze valves since 1888. For additional information, send in the coupon below.

No. 8001 Globe
400 Lbs. WOG
Slip-on Disc Holder

4688-V

O-B VALVES

GET THE DETAILS NOW!

Valve Department
OHIO BRASS COMPANY, MANSFIELD, OHIO
Please send bulletin 1345-V on O-B valves for LPG service, including the No. 8009 with safeguard design.

Name _____
Title _____
Company _____
Address _____
City _____ State _____

to own the largest natural gas reserves of any company. It is the leading producer of natural gas liquids; the leading producer-marketer of liquefied petroleum gases and the largest producer of carbon black manufactured from oil.

Last year the Phillips company produced 24.7 million net bls. of natural gas liquids as compared with 22,304,163 produced in 1954 and with 14,463,470 produced in 1946. In 1954 L. P. gas sales represented 18.5% of total company sales, as compared with 17.8% in 1953 and with only 15.7% in 1946.

Because the rapid growth of the company demanded the expenditure of vast sums of money in all division's of its operations, the per share earnings during the 10-year postwar period have not reflected the true growth in earnings, the report says. But, it adds, "for the next several years the expansion program is not expected to require equity financing and earnings per share from now on should fully reflect the dynamic growth that lies ahead."

Home laundry handbook available from AHLMA

The American Home Laundry Manufacturers Association has published the proceedings from its ninth national home laundry conference in a form which makes it a complete home laundering handbook, handy as a reference or as a guide to teaching.

L. P. gas dealers, especially those who operate general appliance businesses, should find it a valuable addition to their libraries.

Additional information on the book, or a copy of it at $1, is available from AHLMA, 20 N. Wacker Dr., Chicago 6.

Warren, affiliates freed of restraint charges

A Federal Trade Commission hearing examiner has dismissed charges that Warren Petroleum Corp., Tulsa, or its affiliates, Butane Wholesale Gas Co., Little Rock, Ark., and Zero LP-Gas Co., Lake Village, Ark., have restrained trade in the sale of liquefied petroleum gas in the Lake Village area.

Hearing Examiner Abner E. Lipscomb ruled in an initial decision that charges that these firms had lowered prices in the area in 1952 and 1953 to drive out competition were not sustained by the evidence.

This is not a final decision of the

strike it rich

with RHEEM WATER HEATERS

Everybody's collecting Rheem Stamps—the more you save, the more gifts you get— *ALL FREE!*

Talk about a lead-pipe cinch—this is it! There are big gifts, little gifts, glamorous gifts, and gifts galore! And they're yours for the taking. Because everybody wins in Rheem's new "Strike it Rich in '56" program. Here's how easy it is:

You get valuable Rheem Prize Point Stamps with every better grade Rheem Water Heater you buy during the months of April and May. Each stamp is worth 500, 750 or 1,000 points. Next, you check your catalog (it's loaded with all kinds of exciting gifts) to see how many points you need for the gifts you want. It's just that simple!

Pick up your gift catalog today from your Rheem Distributor, and "Strike it Rich" with Rheem Water Heaters.

REMEMBER

When you order water heaters from your Rheem Distributor, some models have a higher point value than others—and will get you your favorite gifts much quicker!

WATER HEATER MODEL	STAMP POINT VALUE
Rheem Custom (Galvanized)	500
Imperial Galvanized	750
Rheemglas Standard	750
Rheemglas Imperial	1,000
Coppermatic	1,000
Large Storage	1,000
Booster Type	1,000

Offer is void in any state or locality where taxed, prohibited or restricted by law.

Rely on Rheem for better products... bigger profits

RHEEM MANUFACTURING COMPANY

SEATTLE • HOUSTON • CHICAGO • SOUTH GATE, CALIFORNIA • SPARROWS POINT, MARYLAND • RICHMOND, CALIFORNIA

commission and may be appealed, stayed or docketed for review.

The examiner also dismissed the charge that Warren had discriminated in the price charged its customers for L. P. gas in violation of Section 2(a) of the Clayton Act as amended by the Robinson-Patman Act.

Warren acquired 51 pct of the stock in Butane-Wholesale in 1950. This firm in turn wholly owns Zero, a retail outlet formed in 1952 to distribute LPG in the Lake Village area. The complaint, issued June 30, 1954, charged that Warren through control of Butane, was responsible for alleged price cutting of from 3 to 4 cents per gallon at retail by Zero in the area, with the intent of injuring, suppressing and destroying competition.

The examiner ruled that Warren purchased Butane as an investment and did not direct or control its affairs. It is settled, the examiner said, that mere ownership of corporate stock is not enough to make the owning corporation responsible for the activities of the subsidiary.

Butane, on the other hand, the examiner said, does control the affairs of Zero, and is responsible for its activities. The evidence, however, the examiner said, indicates only that respondent, Zero LP-Gas Co., lowered its price to meet competition in order to survive in a very competitive trading area.

The lowest price for which Zero sold gas, 7 cents per gallon, was not, as charged, 3 to 4 cents under the prevailing retail price, the examiner said. At least one competitor charged 6½ cents.

Other evidence shows, the examiner added, that in 1953 the retail distributors in the area held a meeting and asked Zero to join in an agreement to fix prices. Zero declined, but raised its prices to 8½ cents when other dealers raised their prices to this figure following the meetings.

The establishment of a monopoly in this area by Zero or Butane was practically impossible, the examiner concluded. This would have involved driving out 11 or 12 retailers, with five larger than Zero, as well as eight wholesalers, including "such economic giants as Gulf Oil Corp, Phillips Petroleum Co. and Lion Oil Co."

Calor forms appliance, equipment organization

Calor Gas Equipment Co., a wholly owned subsidiary of Calor Gas Co., has been formed to distribute a complete line of gas appliances and equipment to Calor dealers in the 11 western states.

ANHYDROUS AMMONIA HOSE

For every need of the AMMONIA INDUSTRY—a special Hewitt-Robins hose

For Anhydrous Ammonia Tanker Loading and Unloading . . .

HEWITT-ROBINS AMMONIA TANKER HOSE. Extra-strong, rugged construction in 4", 6" and 8" ID sizes. Custom-built for this hazardous high-pressure service. Unexcelled service history in loading and unloading propane and anhydrous ammonia tankers.

For Tank Truck and Tank Car Loading and Unloading . . .

MONARCH WIRE BRAIDED ANHYDROUS AMMONIA HOSE. Constructed with a special tube to resist permeation. Contains a strong, non-collapsing wire braided carcass, protected by a green sun- and weather-resistant cover.

For Bulk Delivery Truck Unloading . . .

HEWITT-ROBINS MONARCH LONG LENGTH HOSE. A non-permeable tube, double braid of strong rayon cord and green neoprene cover. Light, flexible, easy to handle. Wide safety factor with 350 psi. Also can be used on applicators requiring high pressure lines. Available in ½", ¾" and 1" sizes.

For the Mobile Tank Applicator . . .

HEWITT-ROBINS SERVALL APPLICATOR HOSE. For installation between regulator and applicator knives. All neoprene with red or green cover. Resists ammonia permeation, thereby minimizing toxic odor. Unaffected by sunlight and weather.

For Aqueous Ammonia Service . . .

HEWITT-ROBINS SERVALL ALL-SERVICE HOSE. Ideal for mobile spray applicators or for nitrogation. Synthetic tube resists permeation. Red neoprene prevents damage from sun and weather.

HEWITT-ROBINS INCORPORATED

EXECUTIVE OFFICES: STAMFORD, CONNECTICUT

INDUSTRIAL HOSE • CONVEYOR BELTING • CONVEYOR MACHINERY • VIBRATING CONVEYORS • VIBRATING SCREENS • DESIGN, MANUFACTURE, ENGINEERING AND ERECTION OF COMPLETE BULK MATERIALS HANDLING SYSTEMS • "GLIDE RIDE" THE NEW MOVING SIDEWALK

Calor's president, Robert E. Maloney, reports that Frank B. Brigham has been named sales manager of the new company. Kenneth Purchase has been appointed general manager and will supervise the new operation.

A special catalog of appliances and equipment has been prepared by the new company and the program is now being inaugurated with the Calor distributor organization.

LPG insurors showed substantial gains in '55

Pan American Fire & Casualty Co. and Pan American Insurance Co., Houston, have again achieved substantial gains in policyholders' surplus and assets during 1955, reported Earl W. Gammage, president and chairman of the board. The Pan American Companies are large writers of butane insurance coverages throughout the South and Southwest.

In releasing the annual financial figures for 1955, Mr. Gammage stated, "Pan American Fire & Casualty Company increased its surplus to policyholders to $1,133,813, and Pan American Insurance Co. to $1,018.-863, which amounted to approximately $100,000 increase for each company. Pan American Fire & Casualty also increased its assets to $3,494,-574, and Pan American Insurance increased its assets to $2,655,485." A favorable increase was also shown in the premiums written by the two companies which amounted to $4,-394,260 in 1955.

"The year 1955," continued Mr. Gammage, "was especially noteworthy in that our insurance companies entered the fire insurance field for the first time and received a substantial volume of good fire business from their many agents." Mr. Gammage also advised that the decision to increase the capital stock of Pan American Insurance Company, announced earlier in the year, was completed by the issuance of a $150,000 stock dividend.

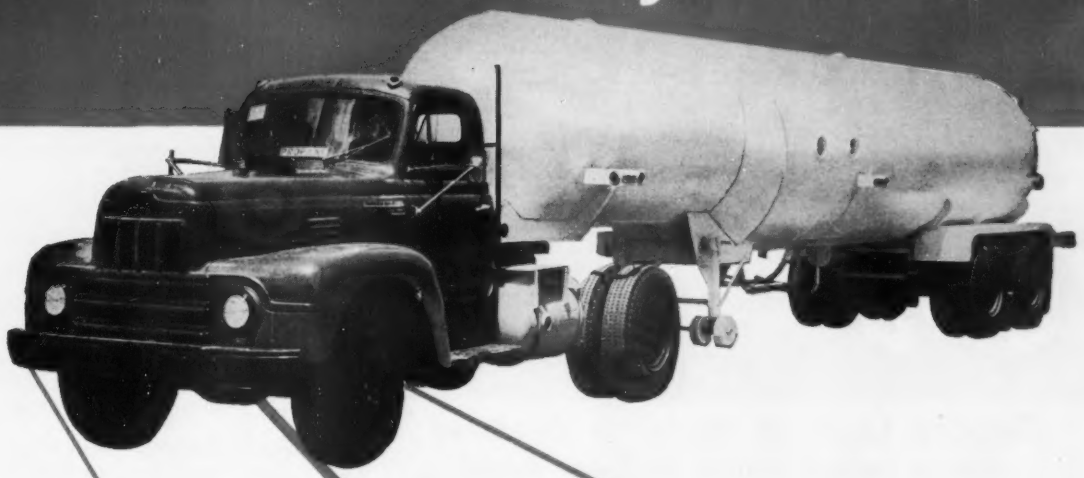
Kindersley, Sask., plant opened by Canadian Propan

A new $150,000 branch with plant and showroom were opened recently in Kindersley, Sask. by Canadian Propane Ltd.

The new plant includes a modern showroom for the display and demonstration of a large selection of gas appliances, warehousing facilities for

Continued on page 96

the LMC Money Maker



is on the road to setting new records in dealer profits

The LMC Money Maker with its increased capacity of 7500 to 8000 gallons with 250 lb. W.P. allows high payloads with a low tractor and trailer investment.

The neckdown design gives you a low center of gravity, higher road speeds and more gallons in your storage tank when you need them. Whatever your LP Gas transport problem, you'll find this unit is a Money Maker for you.

In states with higher legal weight limits, our 9000-plus gallon neckdown unit may be your best buy.

Buy on the LMC budget plan!

WRITE FOR ADDITIONAL INFORMATION, PRICES AND PAYLOADS

LUBBOCK MACHINE & SUPPLY CO

P. O. DRAWER 1589 POrter 2-5261 LUBBOCK, TEXAS

LMC
LOW MILEAGE COST

CALENDAR

Coming events in the Industry

April 5—GAMA 7th Annual Atomic Gas Range conference, Hotel Pierre, New York City.

April 6-7—Northwest District LPGA Annual Convention — Multnomah Hotel, Portland, Oregon.

April 9-11 — 1956 Mountain States L. P. Gas Service School — Downtown Campus, University of Denver, Denver, Colo.

April 9-11 — Legal Symposium on Natural Gas Legislation (AGA) — Waldorf-Astoria Hotel, New York.

April 12-13 — South Dakota LP Gas Convention—Marvin Hughitt Hotel, Huron, S. D.

April 13-14—Western Liquid Gas Association Convention and Trade Show — Hacienda Motel, Fresno, Calif.

April 18-19 — Midwest L. P. Gas Service School—Iowa State College, Ames, Iowa.

April 22-24 — Mississippi LP Gas Dealers Association Annual Convention — Edgewater Gulf Hotel, Edgewater Park, Miss.

April 23-24 — Montana LPGA Annual Meeting, Northern Hotel, Billings.

April 23-25—Association of Nebraska LPG Dealers, annual state convention, Fontenelle hotel, Omaha.

April 28—Nevada Liquefied Gas Dealers Spring Meeting, Ely, Nev.

May 6-9—LPGA 25th annual convention and trade show, Conrad Hilton hotel, Chicago.

May 20-25—Alabama L. P. Gas Service School—Tuscaloosa, Ala.

June 3-5 — Butane-Propane Institute of Louisiana Annual Convention — Roosevelt Hotel, New Orleans.

June 4-8—National Fire Protection Association 60th Annual Meeting — Hotel Statler, Boston, Mass.

June 4-June 29 — Short Course in Gas Technology — North Carolina State College, Raleigh.

June 8-9 — Colorado LPGA Convention and Trade Show—Hotel Colorado, Glenwood Springs.

June 10-12—Arkansas LP Gas Association Annual Convention — Arlington Hotel, Hot Springs, Ark.

June 10-12—Alabama L. P. Gas Sales Clinic—Birmingham, Ala.

June 18-20—Missouri L-P Gas Association 11th Annual Convention and Trade Show — Muehlebach Hotel, Kansas City, Mo.

June 20-22 — Southwestern Butane Exposition (Texas Butane Dealers Association)—Dallas.

June 21-22 — Minnesota Petroleum Gas Association—Edgewater Beach Hotel, Detroit Lakes, Minn.

June 28-29—Central States L. P. Gas Management Conference—University of Kansas, Lawrence, Kan.

June, 1956—Alabama L. P. Gas Carburetion School—Birmingham, Ala.

July 9-August 4 — Short Course in Gas Technology (2nd section) — North Carolina State College, Raleigh.

August 1-3—Central States L. P. Gas Service School—University of Kansas, Lawrence, Kan.

Aug. 5-7—Alabama LP Gas Association Convention — Dinkler-Tutwiler Hotel, Birmingham.

Permaglas® the glass-lined water heater that *Can't be copied*-* celebrates a crowning achievement . . . with a

3,000,000 CELEBRATION

A.O.Smith's 3,000,000 glass-lined water heaters

including a Big National Contest to bring you customers

Contest being announced now in national magazines to over 60 million readers. Everyone *must* come to your store to get entry blanks . . . see product on display . . . win trips to Europe, Hawaii, Bermuda. Call your Permaglas distributor for full details. *You* can't lose!

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- **Special new selling aids**
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Permaglas "formula" is the only *glass proved* tough enough to use in a water heater

This secret Permaglas formula—the result of 30 years of research—is the *only* glass coating yet developed that can resist the corrosive effects of hot water for any length of time. THIS HAS BEEN PROVED BY OVER 3,000,000 FAMILIES!

Call your **Permaglas**® *Distributor and cash in NOW!*

Permaglas®

Through research . . . *a better way*

A.O.Smith CORPORATION

Permaglas Div., Kankakee, Ill.
International Div., Milwaukee 1, Wis.

Continued from page 92

filling cylinders, a loading dock, and storage facilities.

A service area stretching from the South Saskatchewan river to Luselund, and from the Alberta border east to Beechy, will be served by the new plant, which is under the managership of E. H. Harris.

Canadian Propane estimates that by the end of 1956 the company will have 48 installations retailing Blue Flame propane, 11 of them located in Saskatchewan.

Pyrofax plans operation of 96 plants by year's end

A building program which will greatly expand the number of Pyrofax Gas Corp. plants in 1956 to meet increased demands, was announced today by Walter A Naumer, president.

By the end of 1956 the company, which is a unit of Union Carbide & Carbon Corp., expects to have in operation, 96 plants, 85 with both cylinder and bulk facilities, and 11 exclusively for bulk. Cost of this construction program, which began in 1955, is estimated at over $1 million.

As of January 1 of last year, there were 51 Pyrofax gas cylinder filling stations operating in the United States, and one in Canada. During 1955, 12 cylinder filling stations and two bulk plants were completed and placed in operation.

Work has already been started on an additional 10 filling plants. All of these are to be completed and placed in operation during the first half of 1956.

During the remainder of 1956, Pyrofax expects also to complete work on another 11 plants for both cylinder and bulk, expand two of its new bulk plants to include cylinder filling facilities, and add 10 more new plants exclusively for bulk service, giving us a total of 96 plants at the end of this year.

To keep these filling plants supplied, the corporation is also rapidly increasing its fleet of tank cars and trucks. The company had 471 propane tank cars in service at the end of November 1955. Since then, 21 have been delivered, bringing the total up to 492 as of December 31, 1955. By the middle of 1956, the company will increase its shipping capacity by another 25 to 30 tank cars and has ordered an additional 75 for delivery before the end of the year.

The company also has at this time a fleet of seven tank trucks and expects to add at least 13 more between now and the end of 1956.

New corporation formed through recent merger

Controls Corp. of America is the name of a new corporation formed when A-P Controls Corp., Milwaukee, and Soreng Products Corp., Schiller Park, Ill., were merged.

The new organization will be headed by Roy W. Johnson as chairman of the board and Louis Putze as president. Mr. Johnson formerly was president of A-P while Mr. Putze held the same position with Soreng.

Both A-P and Soreng will retain their individual identities and will continue to operate as divisions, under their present names. While each division will operate independently, integration of research and product engineering development facilities will enable the corporation to offer greater diversification and more efficient engineering services, since the combined engineering departments will have a total of 150 men.

Manufacturing facilities will comprise seven plants in the U. S., Canada, and Europe, with a total of more

than 2500 employees. Coordination of purchasing of common components and materials will offer economies in manufacturing, together with centralization of specific processes wherever possible.

Deputy fire marshal named for Tampa, Fla., office

E. H. Ryan, retired engineer who was formerly associated with the design of LPG tankers, manufacturing plants, and refineries, has been named deputy fire marshal for the Tampa field office, according to J. Edwin Larson, Florida state treasurer and fire marshal.

Carl B. Davis, chief deputy fire marshal said Ryan's job will be the supervision of L. P. gas installations and the regulation of explosives.

The Tampa field office handles fire marshal business for these counties: Citrus, Sumter, Lake, Volusia, Seminole, Orange, Hernando, Pasco, Pinellas, Hillsborough, Polk Osceola, Brevard, Indian River, St. Lucie, Okeechobee, Highlands, Hardee, DeSoto, Manatee, and Sarasota.

Marion Nelson joins Suburban Gas Service

M. A. Nelson

Marion A. Nelson, formerly with Parkhill-Wade, Calor, and Tank Gas Inc., has joined Suburban Gas Service, Upland, Calif., as assistant to R. C. Harris, vice president and general manager of the company.

Mr. Nelson will be directly in charge of all purchasing for Suburban and will assist Mr. Harris in administration of many of the field problems connected with Suburban's operations.

Company invests $1 million in eight Texas operations

It is reported that Murmanill Corp., Dallas, Texas, has invested more than $1 million in eight L. P. gas plants in central and east Texas, planning to enter the retail distribution field. The plants are in Ellis, Freestone, Henderson, Leon, Limestone, Navarro, and Robertson counties.

The company has also acquired a two-thirds interest in the stock of the Freestone Underground Storage Corp. near Fairfield. This storage facility is a washed-out salt dome of an estimated 6-million to 7-million-gal. capacity.

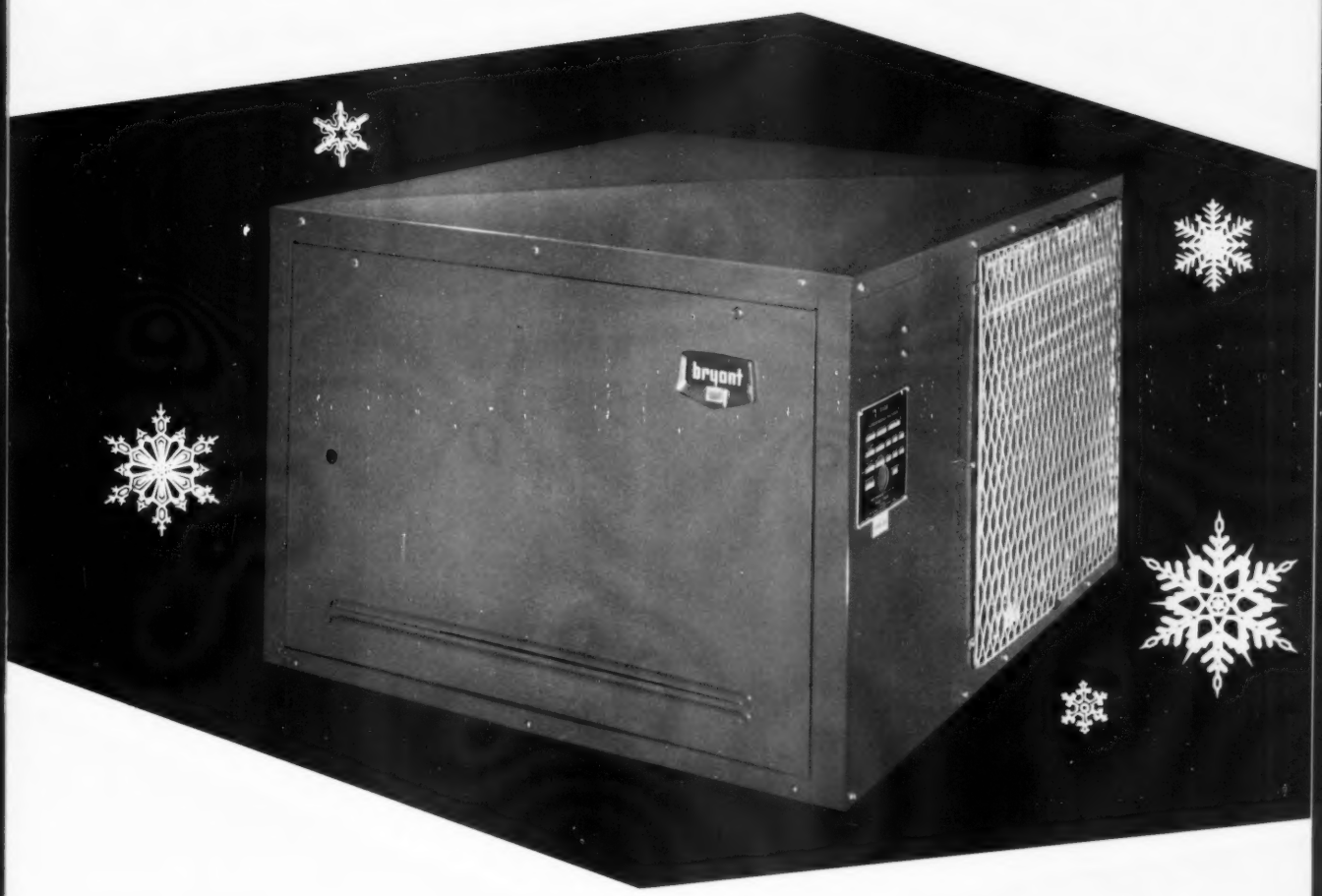
Dan T. McDonald, vice president in charge of operations, said the company has plans for development of L. P. gas for tractor fuel.

Murmanill recently acquired Roney's Inc. and Farmers Fuel Co. of Corsicana, Liquigas Co. of Waxahachie, Butane Service Co. of Fairfield, and Gann's Gas Co. of Ennis.

Suburban Propane holds annual policy meeting

Officers, department and division heads, and district managers of the Suburban Propane Gas Corp., Whippany, N. J., gathered in New York recently for a two-day discussion on management's plans and policies for 1956.

Reluctant to divulge any figures before the annual report is sent to company stockholders, President Mark Anton told the 150 men and women from 16 eastern states that the 1955 sales figure was gratifying and that he is optimistic about 1956.



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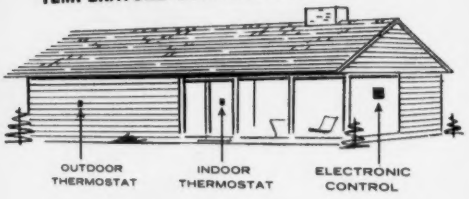

COMPLETE YEAR 'ROUND HOME COMFORT
regardless of temperatures outside. Your customers have read about this system in Life and other national magazines.

OFFER YOUR CUSTOMERS EITHER:

1. No payments 'til cooling season, or
2. No money down — 36 months to pay

FOR FULL DETAILS CALL YOUR BRYANT DISTRIBUTOR TODAY!

and here are 8 more reasons why

you'll grow bigger with BRYANT . . .

1. Your customers know and trust the name Bryant . . . famous for 47 years as the leading name in home comfort.
2. From small home to mansion there's a Bryant to fit the budget and the need in gas or oil furnaces, boilers, air conditioners, space heaters, unit heaters, water heaters.
3. You build customer confidence when you install Bryant . . . the highest quality home comfort equipment built.
4. You profit more with Bryant because of the Bryant dealer development program, the most complete in the industry.
5. You get sales building tools that increase sales and profits.
6. You have the help of a nearby Bryant distributor who gives you complete engineering, sales and service help.
7. You are backed by powerful national advertising.
8. You get complete co-op advertising to build sales in your own community.

Don't miss this tremendous cooling promotion. It's a complete package that will bring prospects for home cooling to *YOU*. For the name and address of your Bryant distributor write, Bryant, 48 Monument Circle, Indianapolis 4, Indiana.

Left, above
AIR COOLED UNIT — MODEL 560
No worry over water restrictions or high water rates. Brings clean, cool, healthful indoor weather no matter what outside temperatures are.

Right, above
"COMMAND-AIRE" TWIN UNIT — MODEL 590
The model that puts complete home air conditioning within the reach of every homeowner. Cools, dehumidifies, filters and circulates the air.

BE MR. B IN YOUR COMMUNITY AND GROW BIGGER WITH BRYANT

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ONLY PEERLESS OFFERS *MORE* ATTRACTIVE FEATURES FOR *GREATER* SALES IN GAS HEATING

Easiest-to-sell . . . smartest contemporary styling . . . stays sold . . . trouble free operation . . . durable easy-to-clean finish...inside easy to clean . . . comfort . . . safety ...clean even heat...rugged construction . . . economy, low operating cost . . . thoroughly engineered...warmer floors assured. The Top Quality Console Heater line for everybody's purse. Consistently the best for over 70 years . . . a better buy than all the rest.

Sell the whole PEERLESS line–reap the whole profit. A size and style for every need.

"WITH THE LOW BOY LOOK"

Peerless

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PEERLESS MANUFACTURING CORP., LOUISVILLE 10, KY.

D-1730
External Relief
Valve For Large
Domestic Systems

S-445
Internal Relief
Valve For
Automotive Use
S-435
For Fork Lift
ICC Cylinders

S- 455
Internal Relief
Valve For Small
Domestic Systems

Relief Valves

Designed the Sel-Pac Way Offers You Maximum Safety

S-481
Internal Spring Type
Relief Valve For Large
Storage Vessels
S-443 — 1"
S-453 — 1¼"
S-481 — 2"

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When you select Relief Valves you are choosing one of the most vital pieces of LP-Gas equipment. Sel-Pac offers you these seven outstanding safety features in every Relief Valve you buy:

1. Proven "pop-type" design. Minimum blow down.
2. High flow capacity.
3. Tamper-proof. Setting cannot be changed without damaging U.L. label.
4. Pipe away stack or adapter does not reduce rated capacity. Rain caps available for most models.
5. Non-corroding brass body and poppet. Specially compounded non-sticking seat disc.
6. Springs tested to very close tolerances. Every valve is factory tested for initial leak setting.
7. Dependability of company behind the product. Years of experience building LP-Gas equipment.

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BPN the trade

Jackson is regional manager for Robertshaw-Fulton

Wilbur Jackson

Wilbur Jackson has been appointed general manager of the Grayson Controls division of Robertshaw-Fulton Controls Co.

Mr. Jackson, a vice president of the company, was formerly works manager of Grayson Controls at Long Beach, Calif. With Grayson since 1928, Mr. Jackson was one of the first two employees at the original plant. He rose through positions as production supervisor, production manager, and head of the assembly department. He became an assistant vice president in 1952 and vice president in 1955.

McNamar names Bolin manager, LPG and ammonia divisions

M. C. "Mac" Bolin has been appointed manager of the LPG and ammonia divisions of McNamar Boiler & Tank Co., Tulsa, succeeding Jerry Hardegree, who has resigned.

Mr. Bolin was sales manager of the LPG division for seven years but has been manager of the gas compressor division of the company for the past 2½ years.

Cities Service Oil names two marketing division managers

B. J. Farwig, marketing division sales manager, Cities Service Oil Co., has announced the appointment of two managers in the division.

Thomas L. Jenkins, Chicago, heads the newly established sales training program, which will embrace the supervision of sales training stations and mobile training units throughout the company's marketing area. Included in the training schedule will be distributor, dealer, and company personnel.

As manager of national account sales, Joseph C. Sparks will supervise sales of all products to national accounts in the company's marketing territory.

Carrier Corp. names Miller to Washington, D. C. post

Herbert E. Miller has been appointed branch manager for the Washington, D. C., office of the Unitary Equipment division of Carrier Corp. In assuming his new duties, Mr. Miller wlil locate his office in the Investment Bldg.

Mr. Miller's first assignment with Carrier was as student engineer in the dealer sales service department, Chicago. In 1948 he was named district service manager in the Jackson, Miss., area, subsequently serving in the same capacity at Carrier's New York and Philadelphia District offices.

Executive appointments announced by Roper

At a recent meeting of the Geo. D. Roper Corp., Rockford, Ill., four officers were named to new posts. John H. Makemson is executive vice president and general manager; L.R. Jensen is vice president and appliance general manager; Norman C. Kreuter is vice president and appliance sales manager; and Charles A. Miller was named assistant treasurer. Also, H. D. Weigel, ordnance general manager, was named to the additional post of director of engineering.

Additional appointments are as follows: Paul Vaughan, eastern manager of special appliances, Philadelphia; Robert H. Ewing, district manager of Washington, D. C., and Virginia territory; John H. Bennett, sales representative in North Carolina, eastern Tennessee, and South Carolina; Elmer C. Cone, sales representative, Kansas City; and Roy K. Rothgeb, service manager, midwestern division, Kansas City.

Magic Chef names Holzman vice president of sales

J. W. Holzman

John W. Holzman has joined Magic Chef Inc., St. Louis, as vice president in charge of sales. His duties will involve supervision of regional sales offices in Boston, New York, Camden, Atlanta, Cleveland, St. Louis, Chicago, Denver, Dallas, and Los Angeles.

Before joining Magic Chef, Mr. Holzman was vice president and general manager of the Cincinnati division of Ohio Appliances Inc. Prior to that he was vice president, director of sales, and a member of the board of the RCA Victor Distributing Corp. and division manager for RCA Estate Stove Co.

Warren's LPG division announces personnel shifts

Warren Petroleum Corp.'s L. P. gas division has announced several changes.

John F. Donovan, who has been manager of the St. Louis district sales office, is now assistant manager of the supply department where he will assist George Southworth in development and maintaining LPG supplies.

John J. Laughlin, who has been a member of the sales staff in the Louisville district sales office, succeeds Mr. Donovan as manager of the St. Louis district office.

W. J. Connelly, who has been chief gas accountant in the Tulsa office for

Pedigreed Perfection

Shot-blasted PREST-O-LITE Cylinders are marked for positive identification through a series of quality-control tests that exceed every ICC requirement. Performance in these tests is remarkably uniform—and is unsurpassed in the industry.

This "pedigreed" quality is built into every PREST-O-LITE Cylinder as a result of LINDE's 50-odd years' experience in making and using compressed gas cylinders. You can pay more, of course, but you can't buy better than the PREST-O-LITE brand.

See your local LINDE representative, or write today for full information. LINDE AIR PRODUCTS COMPANY, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N.Y. In Canada: Linde Air Products Company, Division of Union Carbide Canada Limited, Toronto.

The terms "Linde" and "Prest-O-Lite" are registered trade-marks of Union Carbide and Carbon Corporation.

several years, has been transferred to the L. P. gas sales staff and assigned to the Louisville dsitrict office.

William Tipton has been transferred from the Tulsa office accounting department to L. P. gas sales as assistant to D. G. Smarinsky, who is in charge of LPG sales in Oklahoma.

Hunter is general manager of Gulf Oil retail, jobber sales

A 23-year veteran with Gulf Oil Corp., Robert A. Hunter, has been named general manager, retail and jobber sales, of Gulf Oil Corp.'s domestic marketing department. He succeeds J. L. Lenker, who has recently been named vice president in charge of marketing for British American Oil Co.

In his new position, Mr. Hunter will be responsible in a staff capacity for all of the company's domestic retail business.

Everett Agan "Salesman of Year" of Stewart-Warner division

"Salesman of the Year" among the 60-man national force of Winkler products district sales managers of the U. S. Machine division of Stewart-Warner Corp. is Everett Agan, Indianapolis, Ind.

Mr. Agan, who covers a territory in southern Indiana which also includes several border counties in Kentucky and Ohio, attained the coveted distinction in his freshman year as a district sales manager. He took over the territory just a year ago following several years of service in other capacities at the factory and with a large retail dealer in Indianapolis.

Rockwell names sales manager, two assistant product managers

T. O. Carson

Rockwell Manufacturing Co.'s meter and valve division has named a new Pittsburgh district sales manager and two assistant product managers.

Thomas O. Carson, formerly manager-distributor sales and assistant product manager, Nordstrom valve, now heads the division's offices in Pittsburgh.

A. J. Komich

C. B. Goff

Assistant product managers

C. B. Goff Jr. and A. J. Komich will serve as assistant product managers, respectively, of Nordstrom valves and petroleum and industrial meters. Both will headquarter in Pittsburgh.

Ruud Manufacturing names northern Ohio representative

John Ernst has been named factory sales representative in northern Ohio for Ruud Manufacturing Co., Kalamazoo, Mich.

F. A. McFerran, general sales manager, states that Mr. Ernst's headquarters will be at 3879 W. 229th St., Cleveland. For the last 18 months he was sales representative of Rheem Manufacturing Co. in southern Ohio. Prior to that time he was in the sales

NOW IS THE TIME TO START WHIPPING NEXT WINTER'S PROBLEMS

For far better profits next winter do this before you go fishing:

1. Review your supply contract.
2. Plan for adequate storage both in bulk plant and in customers' tanks.
3. Check your customers' previous purchases and realign storage facilities to save delivery expense.
4. Line up new customers. Get every customer, new or old, to take a full tank before winter sets in.
5. Develop your summer business. Improve your ratio.

If you have any problems your Pure Oil representative will be glad to help you.

Puregas PURE

Be sure with Pure

The Pure Oil Company, 35 East Wacker Drive, Chicago 1, Illinois • Houston, Texas, Box 239 • Worland, Wyoming, Box 38
Minneapolis, Minnesota, 1306 South First Street • Denver, Colorado, 514 Farmers Union Life Insurance Building

department of the Ohio Pipe & Supply Co., Cleveland.

Mr. Ernst will represent Ruud water heaters in contacting the wholesale and retail plumbing and heatin grtade, plus L. P. gas companies, in northern Ohio.

Jack Pettersen named Norge director of merchandising

Norge division of Borg-Warner Corp., Chicago, has appointed Jack S. Pettersen as director of merchandising, a new position.

Formerly director of dealer development, Mr. Pettersen will be in charge of Norge home appliance advertising, sales promotion, sales training, dealer programs, and all other merchandising functions.

Arnold Carlin is sales engineer for Pacific Scientific

New sales engineer in the air conditioning division of the Pacific Scientific Co. is Arnold Carlin, who will represent White-Rodgers controls and Alco valves.

Mr. Carlin, who will operate out of Pacific's Los Angeles office, previously served as test engineer with the AGA laboratories and as chief test engineer for a major manufacturer of air conditioning and control equipment.

Stillinger is manager of new Weatherhead control division

M. P. Stillinger

Weatherhead Co. has announced the appointment of Morris P. Stillinger as sales manager of the company's newly formed controls division. His initial responsibility will be the introduction and sales of a natural gas appliance regulator designed and manufactured by Weatherhead.

During the past 17 years Mr. Stillinger has been in the utility and appliance fields. He was associated with Southern California Gas Co., the Carrier Corp., and Robertshaw-Fulton Controls Co.

Norge appoints eastern regional home economist

Dorothy Glover has been named Norge regional home economist in six eastern states. Miss Glover will work with 11 Norge distributor home service directors in metropolitan New York, Philadelphia, Baltimore, Washington, D. C., Newark; Norfolk, Richmond, and Roanoke, Va.; and Allentown, Johnstown, and Lemoyne, Pa.

For the past two years Miss Glover was district home economist with International Harvester Co. in New York, Philadelphia, and Washington.

Sales district reorganized by Permaglas division

W. T. Halket

Several personnel changes and a consolidation of national sales districts from 10 down to 7 have been announced by the Permaglas division of the A. O. Smith Corp.

Two newly created posts as assistant general sales managers will be filled by W. T. Halket, formerly New England district manager, and J. Wayne Burleson, formerly Southwest district manager.

"PERFECTION" PROPANE SYSTEMS

Have *Sturdier* Leg Design!

Each One-Piece Channel Support Provides Over 200 Sq. Inches of Bearing Surface!

There are many important features about a BS&B "PERFECTION" Propane System that will help them sell readily to your customers. One is the sturdy leg design of press formed, wrap around one-piece steel channel which assures a more even distribution of weight, and which will never collapse under stress and strain!

Other important features are the one-piece weatherproof dome, the recessed internal relief valve for maximum safety, the heavy lifting lugs placed far out on the heads of the tank for better balance and ease of handling, and the *optional* spray fill adapter which allows the tank to be filled to capacity without vapor return line.

Why not standardize this year on the one propane system that has *everything* your customers want and need—BS&B "PERFECTION" . . . with the Golden Dome!

EFFICIENCY
OVER 60 YEARS
BS&B
RELIABILITY
ANOTHER EXAMPLE OF PRODUCT LEADERSHIP

BLACK, SIVALLS & BRYSON, INC.

Propane Equipment Division, Dept. 6-AB4
7500 East 12th Street, Kansas City 26, Missouri

C. L. Hewitt Jr. is manager of heating and air conditioning products.

In the combination of sales districts, W. A. Dunn, New York, becomes manager of the New England area and metropolitan New York; Don Shafer is manager of District 73 out of Pittsburgh, Pa.; Ken O'Gorman, former manager at Pittsburgh, moves to Chicago and takes over the Middle West; L. H. Hoelter is now building products manager in Chicago. Herman Johnson, who formerly headed one of the combined districts at Philadelphia, is now eastern manager of Permaglas water heater sales, also out of Philadelphia.

John L. Stewart has been appointed West Coast heating and air conditioning specialist. Working out of the company's Oakland, Calif., plant, he will cover nine western states.

Sales management changes announced by Perfection

In two sales management changes, the Perfection Industries division of the Hupp Corp. has moved Marion Miller to Kansas City, Mo., as midwest regional manager, replacing F. J. Rudolph, who is going to the home office in Cleveland as assistant to the general sales manager.

The company has also announced the appointment of Harold Kiefer as western sales representative. He will cover Washington, Oregon, and Idaho, as well as the provinces of Alberta, Saskatchewan, and British Columbia in Canada.

Bastian-Blessing's Poethig named to AAI board

R. E. Poethig

The Agricultural Ammonia Institute has elected Robert E. Poethig, who is director of engineering and research for the Bastian-Blessing Co., Chicago, to the board of directors. He is also chairman of the general technical committee of the group.

Mr. Poethig is a former director of the LPGA, served as chairman of the technical and standards committee, and is presently a member of that committee. He serves as chairman of the valve standards committee of the Compressed Gas Association, and is a member of the CGA anhydrous ammonia and liquefied petroleum gas committees. He is also a member of the industry-wide committee on gases of the National Fire Protection Association.

M. F. Ball is treasurer of Universal Liquid Gas

M. F. Ball has been appointed to the office of treasurer of Universal Liquid Gas Service, accroding to Roy Long, president of the company.

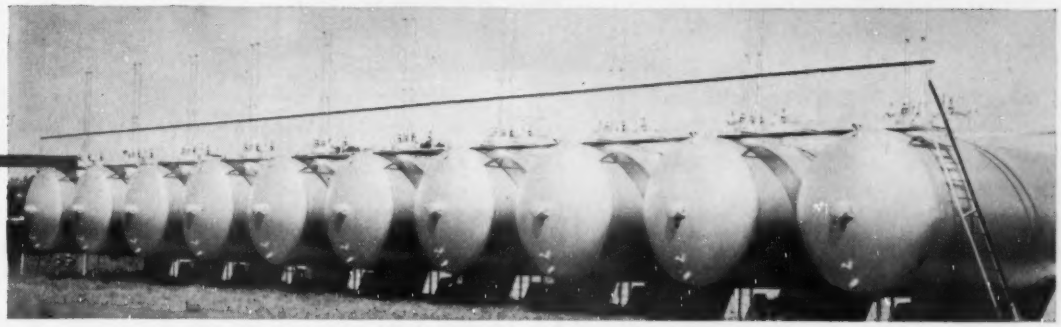
Mr. Ball will be headquartered at the company's general offices in San Francisco.

Edmund Riordan is Janitrol sales representative

E. V. Riordan

Edmund V. Riordan has been appointed sales representative for the Janitrol Heating & Air Conditioning division of Surface Combustion Corp. He will serve the southern Missouri, Illinois, and Arkansas area, representing

For bulk or standby plants . . .



for design, engineering, construction

—your best bet's UNITED!

The originator of One-Source Supply—United—offers a COMPLETE planning, building and maintenance service for L-P Gas bulk and standby plants.

From area survey and blueprints to start of operation, United can take over every task and worry you want to hand us, and turn out a superb result . . . on time, and at the right price. And more: we can serve your every need thereafter—fuel, parts, equipment, systems, counsel—you name it.

Who else can offer so much, so well?

UNITED PETROLEUM GAS CO.

4820 Excelsior Blvd. • Minneapolis 16, Minn.

Representatives throughout the great Central States Area from Canada to the Gulf.

Janitrol heating and air conditioning for commercial, industrial and residential uses.

Mr. Riordan is well known in the trade, being active in sales work since 1929 in the southern Missouri territory. For the past nine years he has been asscoiated with the Amstan division of American Radiator & Standard Sanitary Corp.

Killen is general manager of Downingtown Iron Works

W. L. Killen

Downingtown (Pa.) Iron Works has appointed W. L. Killen general manager. Mr. Killen, who has been works manager, joined Downingtown last August. Prior to that he was general manager of Chicago Steel Tank Co.

The company has also announced the election of T. G. Ashworth as treasurer and J. R. Piersol as secretary. Mr. Ashworth has been with the company since 1944, active in accounting and financial matters. Mr. Piersol joined the company in 1924 and has served in various administrative capacities since 1932.

Bustad named General Controls field rep in Los Angeles

General Controls Co. has appointed Joe Bustad as field representative for the Los Angeles office. Mr. Bustad, who has been with General Controls since 1952, is assigned to the San Fernando valley territory and will reprseent the company's full line of automatic pressure, temperature, level and flow controls.

American Car names Belcher Chicago sales agent

The American Car & Foundry division of ACF Industries Inc., New York, has appointed David J. Belcher sales agent in the Chicago office.

Prior to his new appointment, Mr. Belcher, who has been with ACF since February 1953, was sales assistant in New York and sales agent in the Philadelphia office.

Victor Mauck, 65-year veteran with John Wood, retires

Victor Mauck, who joined John Wood Co. as office boy in 1891, has retired from the company's board of directors.

In 1899, at the age of 26, Mr. Mauck bought the company from his uncle, John Wood Jr. Under his leadership, the company grew from about $65,000 annually to today's volume of about $40 million.

Trade shorts

Charles S. Hempelman has been named market analyst for the LeRoi division of Westinghouse Air Brake Co., Milwaukee. . . . Wendell Ford is representative for the Bengal Range division of John Wood Co. in the Del-Mar Peninsula, Baltimore, and Washington, D. C., area. . . . Charles F. Venrick, formerly Chicago district sales manager of Alco Products, is now district sales manager in Chicago of the American Car & Foundry division of ACF Industries Inc., New York. . . . Minneapolis-Honeywell has named Vince Tassi industrial manager for Hartford, Conn., and Lyle Russell industrial manager for Chicago. . . . Gas range dealers in the "outstate" Michigan area will be handled by Gene L. McGuire, Detroit, as territory manager of Tappan Stove Co. . . . Robert M. Marberry has joined Whirlpool-Seeger Corp., St. Joseph, Mich., as special executive assistant to Jack Sparks, general sales mgr.

Dennis F. McCarthy

Dennis F. McCarthy, 67, former vice president and general manager of the A. O. Smith Corp. of Texas at Houston and former manager of A. O. Smith's Tubular Products division at Milwaukee, passed away in Milwaukee in February after a long illness.

Mr. McCarhty had a wide acquaintance in the gas and petroleum industries. He came to A. O. Smith in 1936 and served on the president's staff for 10 years before becoming head of the Tubular Products division when it was so formed in 1947.

Carl Vincent Alexander

Carl V. Alexander, chief engineer of Dearborn Stove Co., Dallas, was killed in an automobile accident in west Texas late in January.

Mr. Alexander, a native of Waynesburg, Ohio, joined Dearborn in April 1946 as an engineer in the company's new product development division. He was named chief engineer on Dec. 1, 1955.

Suburban Propane Gas Corp., Whippany, N. J.

Fuelane Corp., Liberty, N. Y.

Pure Gas Service Company, Worland, Wyo.

WHY MODERN LP-GAS COMPANIES USE *metered* SERVICE

Consumers Gas Co., Detroit Lakes, Minn.

Suburban Gas Service, Inc., Upland, Calif.

These outstanding LP-Gas Companies and many others over the nation use LP-Gas Meters *because* —

METERS provide regular "city utility" type service.

METERS build customer confidence in the service.

METERS help sell more appliances and more gas.

METERS diminish seasonal demand problems through on-customer-premise storage.

METERS simplify deliveries through regular delivery patterns without costly cross-hauling.

METERS reduce multi-service installation costs.

There is an American® LP-Gas Meter for every kind of installation — industrial, commercial, farm and home.

W-60 Welded Steelcase

2B-40 Brasscase

2B-50 Aluminumcase

5B-225 Aluminumcase

Write for full details:

AMERICAN METER COMPANY
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GENERAL SALES OFFICE 1513 Race Street, Philadelphia • Albany • Alhambra • Atlanta • Baltimore • Birmingham • Boston • Chicago • Dallas • Denver • Erie • Houston • Kansas City • Los Angeles • Minneapolis • New York • Omaha • Pittsburgh • San Francisco • Seattle • Tulsa
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SUPPLIERS TO THE GAS INDUSTRY for Ironcase, Tinned Steelcase, Aluminumcase and Welded Steelcase Meters • American-Westcott Orifice Meters • Instruments • Reliance Regulators • Provers • Apparatus

BPN

associations

Northeastern convention attracts 1500 L. P. gasmen

More than 1500 L. P. gasmen—marketers and suppliers—from West Virginia to Maine were told recently that "new uses for your products have characterized the creativeness of the (L. P. gas) industry's third of a century."

The speaker was Jennings Randolph, former congressman from West Virginia, who was addressing the first luncheon at the Northeastern LPGA convention and trade show in Washingtno, D. C. He noted that "research and development, production and marketing have combined to give the liquefied petroleum gas industry an important status in our dynamic economy. Rapid strides have been made through technological advances. You have been able to absorb these and have passed them on to an increasing number of satisfied customers."

Mr. Randolph went on to say that "resourcefulness in the coming years will surely stimulate sales. Your business has been marked by vigorous individualism. I hope that you will continue to grow within the framework of flexibility rather than to be strait-jacketed by narrow concepts and channels of doing business."

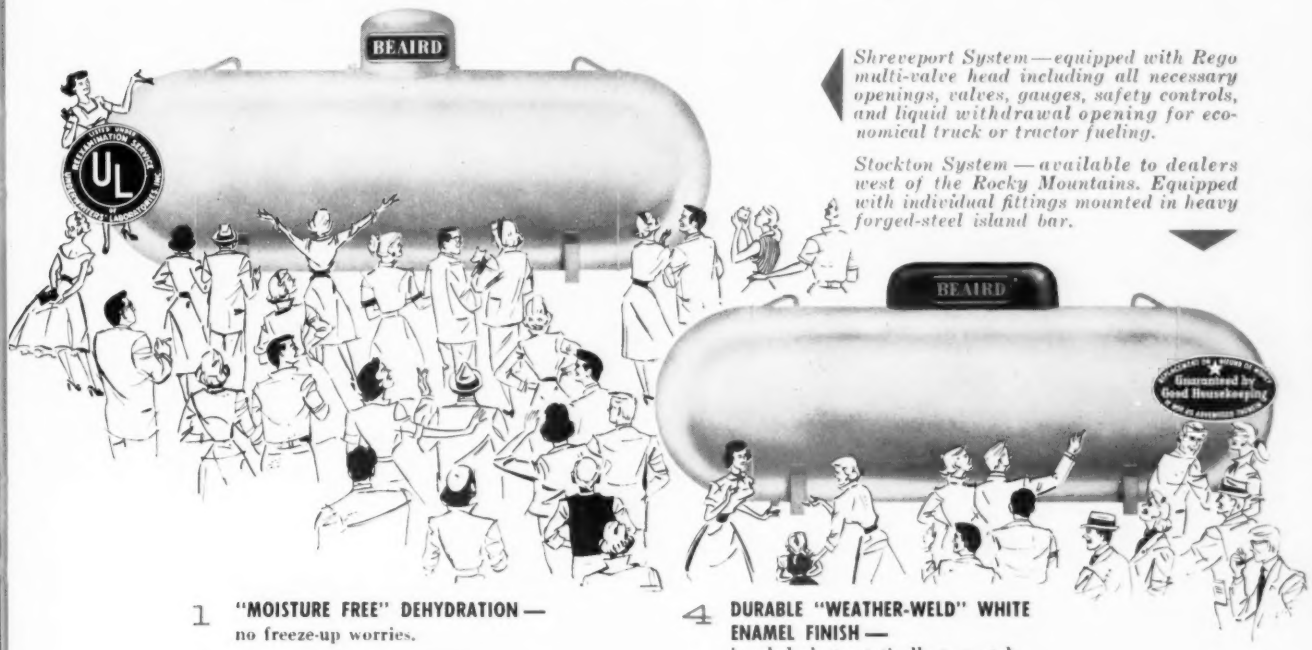
One of the most important talks at the three-day meeting was that of Everett J. Boothby, president of the Washington (D. C.) Gas Light Co. He promised that "through the coordinated efforts of the utility industry and LP industry, gas . . . can forge ahead." An abstract of Mr. Boothby's talk appears elsewhere in this issue.

Other speakers at the convention were Sheldon Coleman, president of the Coleman Co., Wichita, Kan., who spoke on progress in air conditioning; Kenneth R. D. Wolfe, president of the National LP-Gas Council, gave a report of that group's activities; John D. Corrigan, president of the Executive Institute, spoke on profit-making techniques in management; and Dr. Kenneth McFarland, educational consultant to General Motors and the American Trucking Associa-

WHY BEAIRD SYSTEMS ARE —

Winning New Customers

Take a few moments to examine the "Extras" in Beaird LP-Gas Systems and you will immediately see why Beaird is first choice with Dealers, Builders and Homeowners everywhere. See how Beaird's many exclusive features in these systems give dependable performance with exceptional economy — and how Beaird's "Profit Plan Financing" lets you expand your LP-Gas business to bring in these new customers and meet competition.



Shreveport System — equipped with Rego multi-valve head including all necessary openings, valves, gauges, safety controls, and liquid withdrawal opening for economical truck or tractor fueling.

Stockton System — available to dealers west of the Rocky Mountains. Equipped with individual fittings mounted in heavy forged-steel island bar.

1 **"MOISTURE FREE" DEHYDRATION —** no freeze-up worries.

2 **HIGHEST QUALITY FITTINGS —** assure year 'round safe dependable service.

3 **SAFETY-BUILT CONSTRUCTION —** offset head-to-shell construction, machine welded seams and extra strong lifting lugs and supporting legs.

4 **DURABLE "WEATHER-WELD" WHITE ENAMEL FINISH —** bonded electrostatically to metal.

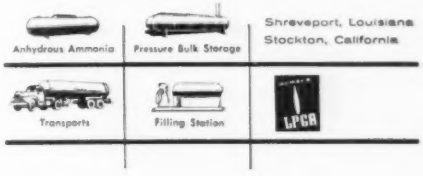
5 **ADVERTISING AND MERCHANDISING AIDS —** hard-hitting dealer level sales support: mailers, newspaper mats, radio and television materials ... plus Good Housekeeping Seal.

6 **STOCKING POINT PROGRAM —** puts the size system you need where you can get it in a hurry without delay or inventory expense.

Write today — for complete information or for a Beaird "Profit Plan" designed to make your business grow.

THE J. B. BEAIRD COMPANY, INC.

BEAIRD



Sell the systems that will stay new for the years ahead

Now ... 1,000 BONUS GALLONS EVERY TRIP

... WITH BEAIRD *Payliner* TRANSPORTS

You can actually count on a Beaird Payliner single-tank transport to do your job faster and for less money. With bigger legal payloads, one Payliner can mean an extra $4,000 profit, in a single year's operation. And low original cost plus long term financing starts you saving the day you buy.

EXTRA CAPACITY SAVES YOU TIME

You haul bigger loads on a time-saving schedule and save money doing it. Beaird Payliners fill quickly and have front and rear outlets to speed up unloading. Their low center of gravity and excellent balance makes them tops in maneuverability... reduces wear and tear on operator and equipment.

BUILT-IN RUGGEDNESS SAVES YOU MONEY

Structurally designed to eliminate excess dead weight, Beaird Payliner tanks are formed from high tensile steel, 100% x-ray of seams and stress relieving assures maximum strength and safety. The entire unit is fabricated according to 1952 ASME code for 250# or 265# working pressure.

PRODUCT ENGINEERED SIZES FOR IMMEDIATE DELIVERY

Single-tank Payliners: 7,200 w.g. capacity for Propane or Butane — 6,165 w.g. capacity for Anhydrous Ammonia.

Twin-tank Payliners: 5,600 or 6,000 w.g. capacity for Propane or Butane — 5,380 w.g. capacity for Anhydrous Ammonia. Other sizes to meet special operating requirements are available on custom order.

Buy full load capacity — Write today for a quotation on a Beaird Payliner transport sized "just right" to fit your hauling needs and financed to fit your pocket.

THE J. B. BEAIRD COMPANY, INC.

BEAIRD

Shreveport, Louisiana
Stockton, California


L-P Gas


Anhydrous Ammonia

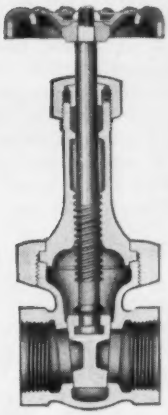

Pressure Bulk Storage

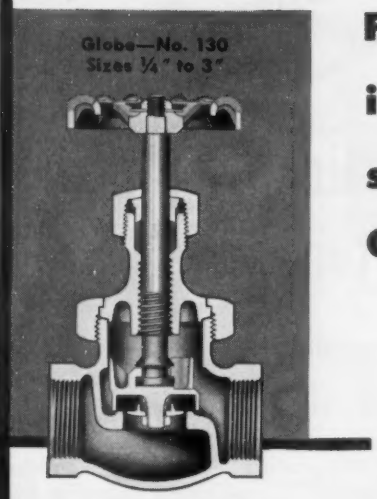

Transports


Filling Station

LPGA

Gate—No. 422
Sizes ¼" to 3"





For consistent safety in L-P Gas handling . . . standardize on CRANE bronze valves

In bulk plant, piping, on tank truck, or in customer installations—*safety* becomes a greater certainty when you use these Crane Bronze Valves in all LP-gas services.

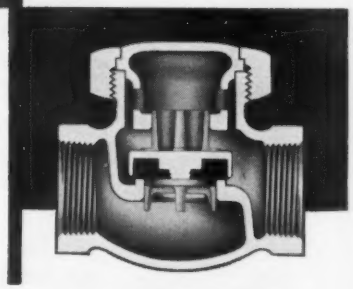
Available at your local Crane outlet in globe, angle and gate patterns from ¼" to 3", and in check design from ¼" to 2", these rugged valves are completely approved by Underwriters' Laboratories, Inc.

To assure safer, more efficient handling of LP-gases—even under the severest service conditions—Crane Bronze Valves are *built* to stay tight. Globes, angles and checks are fitted with a snug, long-wearing, removable composition disc, cemented into the disc holder to insure tight seating. Crane gate patterns have a fully guided wedge disc that seats with precision and minimizes seating surface wear.

Standardize on Crane Bronze Valves for all your LP-gas handling. You'll be safer—and your customers will feel more confident. Ask your Crane Representative for complete details or write to address below.

Angle—No. 131
Sizes ¼" to 3"

Check—No. 132
Sizes ¼" to 2"



CRANE VALVES & FITTINGS

PIPE • KITCHENS • PLUMBING • HEATING

Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas

tion, titled his talk "Lamplighters."

State and district meetings were held by the LPGA's east-central and New England districts; the New York, West Virginia, New Jersey, and Pennsylvania board of directors; and the east-central district executive committees.

Presiding officers were E. O. N. Williams, general chairman, east-central district; J. D. Stone, co-chairman, New England district; Arthur E. Bone, district director, east-central district; and Max Raflowitz, district director, New England district.

More than 50 exhibitors from all over the country displayed their products and services at the trade show.

Highlights of the banquet and show, which climaxed the convention, were the drawings for grand prizes. The ladies' grand prize was a chest of Oneida Community sterling silver while the holder of the lucky ticket in the men's drawing drove home in a 1956 Chevrolet station wagon.

Wide range to be covered at Midwest service school

The sixth Midwest L. P. Gas Service School is scheduled for April 18-20 at Iowa State College in Ames, Iowa. Sponsored by the education committee of the north central section, District 4, of the Liquefied Petroleum Gas Association, the school is conducted by the engineering extension of Iowa State.

The following subjects will be covered: Properties of LPG, causes and effects of improper LPG pressures, correct venting practice, what the homemaker expects from the serviceman, tips on installation and operation of L. P. gas appliances, an analysis of service problems, correcting complaints on LPG clothes dryers, ranges, and water heaters; L. P. gas heating, L. P. gas fire-fighting demonstration, safe practices for the servcieman, panel discussions of questions from servicemen, and customer relations.

The school costs $10 for each student, and 100 students can be accommodated.

Illinois fire marshals go back to school

A wide range of subjects was covered at the recent Illinois Fire Marshal's deputy school held at the St. Nicholas hotel in Springfield.

Following a welcoming address by Carl Mitchell, president of the Illinois LPGA, R. E. Worth, Phillips Petroleum Co., lectured on product, his-

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THE WATER HEATER NAME THAT HELPS YOU SELL!

NO EXTRA CHARGE FOR L.P.G. GASES!

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SUPER-GLASS LINED

NEW GOLD OR CHROME TRIM

10 YEAR WARRANTY

REPUBLIC IS MORE THAN A NAME ...IT'S A GUARANTEE!

RUST PROOF

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OWEN'S CORNING FIBREGLAS INSULATION

DUPONT DULUX EXTERIOR FINISH

100% SUPER THERMOSTAT CONTROLS

Model No.	2 NSP	3 NSP	4 NSP	5 NSP
Capacity in U.S. Gallons	30 GALLON	30 GALLON	40 GALLON	50 GALLON
Reheat Per Hr. 60° rise in U.S. Gallons 100° rise	37.8 23.7	44.1 26.5	44.1 26.5	44.1 26.5
Burner Rating B.T.U. Per Hr.	27,000	31,500	31,500	31,500
Size Gas Supply	½	½	½	½
Size Hot Water	¾	¾	¾	¾
Size Cold Water	¾	¾	¾	¾
Spread Hot & Cold Water	8	8	8	8
Vent Size	3	3	3	3
Color of Body	White	White	White	White
Color of Trim	Gold or Chrome	Gold or Chrome	Gold or Chrome	Gold or Chrome

For LP gas no extra charge

NSP

NEW STANDARD THERMOGLAS

NEW MINI PILOT

SIZE OF HEATER	A	B	C	D	E	F
20 Gals	54¾	55¾	60½	16⅜	17⅛	4⅛
30 Gals	57⅛	58¾	62⅝	16⅜	17⅛	4⅛
40 Gals	60½	61⅝	65⅜	18⅛	17⅛	4⅛
50 Gals	60½	61⅝	65⅜	20⅛	17⅛	4⅛

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SPECIAL MODEL

1 YEAR WARRANTY

REPUBLIC IS MORE THAN A NAME ...IT'S A GUARANTEE!

A.G.A. APPROVED

NEW WHITE & GREY TRIM

100% THERMOSTAT CONTROLS

FOR HOT WATER MAGIC GAS has got it!

NEW HIGH RECOVERY

OWENS CORNING FIBREGLAS INSULATION

— SPECIAL MODEL — 1 YEAR WARRANTY

BUILT LIKE A BATTLESHIP

NEW MINI PILOT USES ANY GAS LOW COST OPERATION

BUILT-IN PILOT FILTER

SP SPECIAL MODEL

ROUGH-IN SPECIFICATIONS

SIZE OF HEATER	A	B	C	D	E	F
30 GALLON	55⅝	57⅛	61⅛	16⅜	17⅛	5⅛
30 GALLON	58⅛	60⅛	64⅛	16⅜	17⅛	5⅛
40 GALLON	61⅛	63⅛	67⅛	18⅛	17⅛	5⅛
50 GALLON	60½	61⅝	65⅜	20⅛	17⅛	4⅛

MODEL NO.	2SP	3SP	4SP	5SP
Capacity in U.S. Gallons	30 GALLON	30 GALLON	40 GALLON	50 GALLON
Reheat Per Hr. 60° Rise	37.8	44.1	44.1	44.1
in U.S. Gallons 100° Rise	23.7	26.5	26.5	26.5
Burner Rating B.T.U. Per Hr.	27,000	31,500	31,500	31,500
Size Gas Supply	½"	½"	½"	½"
Size Hot and Cold Water	¾"	¾"	¾"	¾"
Spread Hot and Cold Water	8"	8"	8"	8"
Vent Size	3"	3"	3"	3"
Color of Body	White	White	White	White
Color of Trim	White & Grey	White & Grey	White & Grey	White & Grey

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OF ODIN STOVE MANUFACTURING CO

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Photographed at the Illinois fire marshal's school were (standing, l to r): Deputy Emrich; Len Nyberg, Western Propane; Bob Dieckelman, Pressed Steel; Deputy Rose; Carl Mitchell, Redigas; Sam McTier, Bastian-Blessing; R. E. Worth, Phillips Petroleum; James Wasson, department of public safety; Deputy Schubert. Seated: John E. Kelderhouse, LPGA; Deputies Stewart and Van Armour; Roy Richardson, department of public safety; and Deputies McFarlan, Weller and Roberts.

tory, characteristics, properties, storage and transportation of L. P. gases. This was followed by a question-and-answer period, as were all the lectures.

Other subjects and speakers included the following: Bulk plant design, loading, unloading, plant storage, cylinder filling, delivery, and handling, by Len Nyberg, Western Propane Co.; customer storgae, specifications on tanks and cylinders, above and below ground installations, by Bob Dieckelman, Pressed Steel Tank Co.; valves, regulating equipment on tanks and cylinders and all utilization equipment necessary for safe operations of tanks, truck transports, and customer installations, by Sam McTier, Bastian-Blessing Co.; customer storage installation bulk and cylinders (illustrative film), by Carl Mitchell, Redigas Inc.; approved appliances and heating equipment installations, by John E. Kelderhouse, LPGA-North Central secretary; industrial and farm uses, by Al Wielfle, Illinois state director, LPGA.

Walter Chapman, Chapman Gas Co., conducted a field trip and plant survey as part of the school.

Industry men trek to Chicago for annual meet

The executive director of Ford Motor Co.'s sales and advertising staff, Thomas J. O'Neil, will be a key speaker on the convention program of the LPGA when members gather in Chicago next month for their annual convention and trade show. He will address an expected 4500 gasmen on May 7, the second day of the meeting at the Conrad Hilton hotel.

Many events at the convention will be keyed to the silver anniversary, which is being celebrated this year by the LPGA, according to C. O. Russell, Rapid-Thermogas Co., Des Moines, Iowa, convention chairman.

The trade show will open May 6 (Sunday) with a special local dealer-day admission rate for LPG servicemen whose jobs prevent them from taking in the full program.

A marketers' program featuring sales promotion and load building for off-peak applications is being prepared under the directoin of Jack Coughlin, Westland Oil Co., Minot, N. D., marketers section chairman.

A separate ladies' program is being arranged, climaxing in a drawing for a silver service set during the annual banquet. For entertainment, all conventioneers will be invited to the annual association cocktail party Tuesday evening. The usual banquet and 1956 edition of the Gas Flame Gaieties will close the gathering on Wednesday evening.

Research, utilization men meet this month

The 11th annual research and utilization conference of the American Gas Association, meeting April 3-4 in Cleveland, will be built around the theme, "Today's Research Pays Tomorrow's Dividends." Meeting place is the Hotel Cleveland.

Prominent in the program will be reports on gas air conditioning and gas incineration, which have been subjects of intensive research recently. Highlights of the past year's advance in other fields of domestic research and utilization accomplishments will be among the other dividends from this forum.

Panel discussions, technical sub-

jects in non-technical prose, clinic evaluation of major questions, and luncheon speakers will comprise the program. Among presentations will be a review of the AGA's air conditioning research program; data on gas vs. electric range top burner speed tests; domestic gas incinerator research; and gas engine-driven summer air conditioning equipment.

Among speakers are R. A. Malony, Bridgeport (Conn.) Gas Light Co.; W. F. Rockwell Jr., president, Rockwell Manufacturing Co. and Gas Appliance Manufacturers Association; and C. S. Stackpole, AGA managing director.

Three schools planned for Alabama dealers

Alabama dealers will have an opportunity to attend three schools planned by the Alabama L. P. Gas Association.

The Alabama L. P. gas service school, scheduled for May 20-25 in Tuscaloosa, will stress assembling and disassembling various types of controls, regulators and piping, venting, and general safety.

Plans are being made for a new carburetion school in June. This school will be designed to teach some of the facts about carburetion both from a theoretical and practical standpoint. Emphasis will be on lab work with different types of equipment set up as field problems. Some of the subjects are theory, ignition and high compression, maintenance of carburetors and vaporizers, tuning and adjusting, pre-conversion check, trouble-shooting, advantages of LPG, and use of the dynamometer.

On June 10-12 the Alabama group will sponsor a sales clinic for sales, service and delivery men. Probable courses include: sales opportunities in Alabama, sales opportunities in the LPG industry, the man in salesmanship, the sales approach, presenting the sales story, closing the sale, keeping the sale closed, and human relations in selling.

For additional information on these schools, contact James L. Deupree, executive secretary, Alabama LPGA, 3024 Sumter Ave., Montgomery.

Clarence Goodman (right), outgoing president of the Michigan LPGA, congratulates his successor, M. R. Frank, elected at the recent meeting of the group. Mr. Goodman is with Goodman Bottle Gas Service, Gladstone, Mich., while Mr. Frank is with Adrian (Mich.) L. P. Gas.

Mountain states hold service school this month

The Mountain States L. P. Gas Association will hold its gas service school on April 9-11.

The school for servicemen will be held at the downtown campus of the University of Denver in Denver.

Attendance record snapped at eastern Canada meet

New attendance records were reached in Montreal recently when operators from every province in eastern Canada assembled for the annual convention of District 11, LPGA.

This year's convention was coupled with a two-day short course on L. P. gas installation and service which drew more would-be students than the facilities could accommodate. W. B. Firner, course director and education committee chairman for the

district, states that additional schools will be organized in the near future to accommodate servicemen unable to attend the Montreal school.

Members elected Percy V. Bourne, Shorgas Limited, Oshawa, Ont., to the district chairmanship for a two-year term and approved an enlarged executive committee composed of: J. F. F. McQueen, Superior Propane Ltd., Toronto; W. T. Glass, Weatherhead Co. Ltd., St. Thomas; H. Wren, John Inglis Co. Ltd., Toronto; John Edwards, Edwards Sudbury Ltd., Sudbury; H. C. Panet, Quick Propane Gas, Richelieu, P.Q.; E. O. Milette, Pyrofax Gas Ltd., Montreal; Leon Simard, Engineering Products of Canada Ltd., Montreal; M. Taylor, Apex Heaters Ltd., Montreal; W. B. Firner, Petroleum Gas Systems, Moncton, N. B.; H. L. Hill, Sumner Propane Ltd., Moncton, N. B.; and M. O. Fletcher, Fredericton Propane Ltd., Fredericton, N. B.

A highlight of the convention was the illustrated report on Operation Cue given by LPGA President C. J. McAllister. Howard White LPGA executive vice president, provided a detailed analysis of the relations between eastern Canadian district members and the national association in the U. S. which emphasized the advantages to the Canadian industry of access to the long experience of LPG operators in the United States, particularly in the field of regulations.

C. M. Corken, Corken's Inc., Oklahoma City, gave an informative though amusing talk on "A Little More Profit." H. L. Hill of Sumner Propane, Moncton, N. B., presented an estimate of the industry's growth prospects in 1956 with a consensus of industry recommendations for improving association's service to the industry and taking advantage of new markets. His report was based on intensive study and investigation on the situation in eastern Canada during the past three months.

Northwest LPG dealers meet in Portland

A program of special interest to dealers in the northwestern section of the U. S. will be presented at the 9th annual Northwest District LPGA convention on April 6-7. Meeting place is the Multnomah hotel in Portland, Ore.

The convention program and scheduled sessions will take place on the afternoons of the 6th and 7th.

Social events, including cocktails, a dinner and show, will be held on Friday evening, April 6.

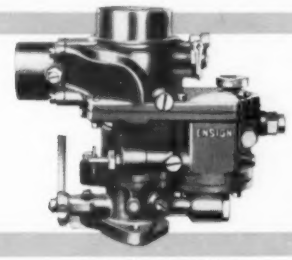
POWER for Agriculture Automotive and Industry

CARBURETION • INSTALLATION • SERVICING

LP-GAS
VAPORIZER-REGULATOR

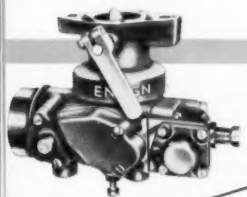
ENGINE SAFETY SHUT-OFF VALVE
VACUUM OPERATED

XG GAS CARBURETOR
1¼ TO 2 IN. SAE



CG GAS-GASOLINE
COMBINATION CARBURETOR
1¼ TO 2 IN. SAE

MGI GAS CARBURETOR
¾ AND 1 IN. SAE



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Complete line of vaporizers and carburetors from 5 to 500 HP.

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LP-GAS Carburetion

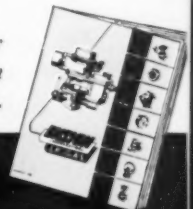
. . . pays for itself over and over again

Satisfaction with LP-Gas as an engine fuel depends greatly upon the carburetion which you select.

You pay no premium for Ensign — the carburetor that starts easily, performs excellently, develops full power and economy, is ruggedly built and is in demand everywhere.

Ensign carburetion is DEPENDABLE. In the long run you are money ahead to specify Ensign for every kind of LP-Gas powered equipment. Simply tell us your engine make, model and speed. We'll recommend the best equipment to do the job.

Send for new Ensign literature today.



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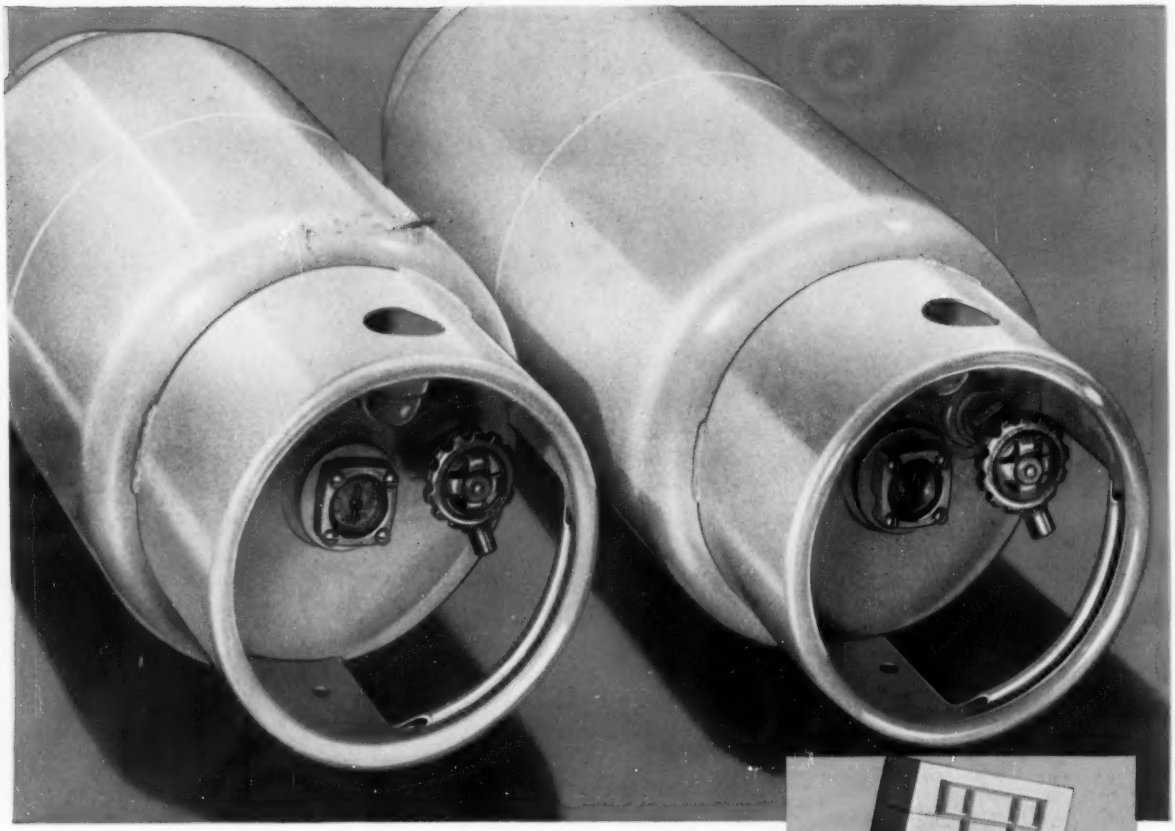
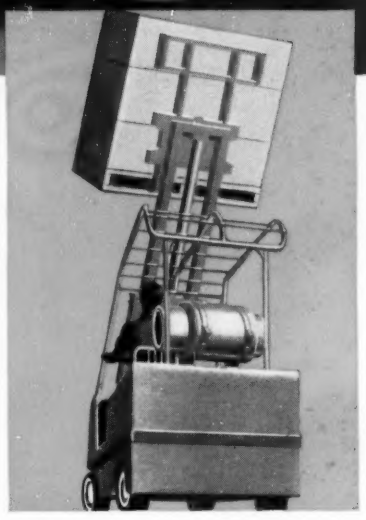
7010 S. Alameda St., P. O. Box 229, Huntington Park, California
Branch Factory; 2330 W. 58th St., Chicago 36, Illinois

Pioneers in Efficient Carburetion Established 1911



the BIG LIFT for LP-Gas sales

• • • lift truck customers / Hackney cylinders



Boost your *profits* with lift truck cylinders. It is *profitable* year around *cylinder business* and presents a steady gas load. The lift truck and industrial tractor field has scarcely been touched. Manufacturing plants, warehouses, docks, in fact wherever materials are handled, represent attractive markets for the conversion of equipment to LP-Gas carburetion.

Three sizes of HACKNEY lift truck cylinders are available to fit most units. They have been designed with and approved by all leading industrial lift truck manufacturers. They comply with applicable ICC specifications, valves and gauges are UL approved and are in full conformance with Pamphlet 58 of the National Bureau of Fire Underwriters.

Don't miss prospective business, because you lack cylinders. Purchase a supply of HACKNEY two-piece lift truck cylinders today. They are the accepted standard of the industry and present the best appearance. They are available from stock with valves and visible float gauge installed, tested, dried and painted in three sizes — 20, 33½ and 43½ pounds propane capacity for horizontal installation. The quick disconnect fitting is optional.

Write today for more information.

In addition to the standard 20#, 33½# and 43½# cylinders, special sizes of cylinders can be furnished for both vertical and horizontal use. ASME tanks are also available for permanent installation. Cylinders are stocked at Milwaukee and Downingtown plants.

Pressed Steel Tank Company

1487 South 66th Street, Milwaukee 14, Wis. • *Manufacturer of Hackney Products*

District Offices: 52 Vanderbilt Ave., Rm. 2099, New York 17 • 227 Hanna Bldg., Cleveland 15, Ohio • 936 W. Peachtree St., N.W., Rm. 112, Atlanta 3 • 208 S. LaSalle St., Rm. 790, Chicago 4 • 552 Roosevelt Bldg., Los Angeles 17 • 4550 Main St., Rm. 204, Kansas City 6, Mo. • Downingtown Iron Works, Inc., Division, 138 Wallace Ave., Downingtown, Pa.

CONTAINERS AND PRESSURE VESSELS FOR GASES, LIQUIDS AND SOLIDS

Hackney MILWAUKEE

LP-GAS CONTAINERS FROM ONE POUND TO 30,000 GALLONS

BPN exclusive

Douglas industrial trucks show quick saving of conversion costs

The Douglas Aircraft Co. operates one of the largest fleets of converted forklifts and industrial trucks in the United States. We are happy to present the complete story of this conversion, including the cost data developed during their preliminary tests.

Douglas industrial trucks are fueled at company's general service station in plant yard. Four hundred feet of piping had to be laid.

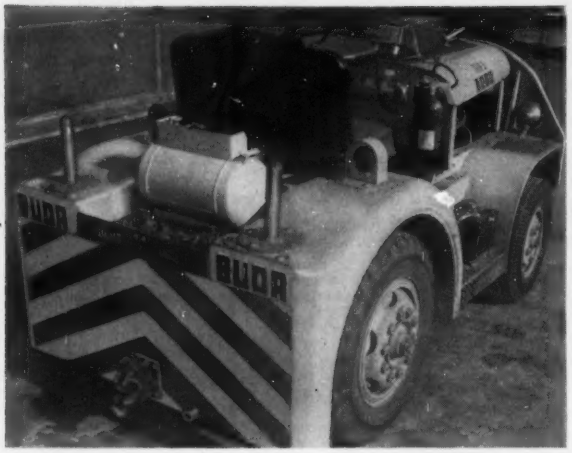
By K. W. COGHILL, Superintendent of Maintenance • Transportation Dept., Douglas Aircraft Co. Santa Monica, Calif.

FOLLOWING a comparative test which began about three and a half years ago, Douglas Aircraft Co.'s Santa Monica plant completed the conversion of 103 gasoline-powered industrial material handling units to propane in January 1955.

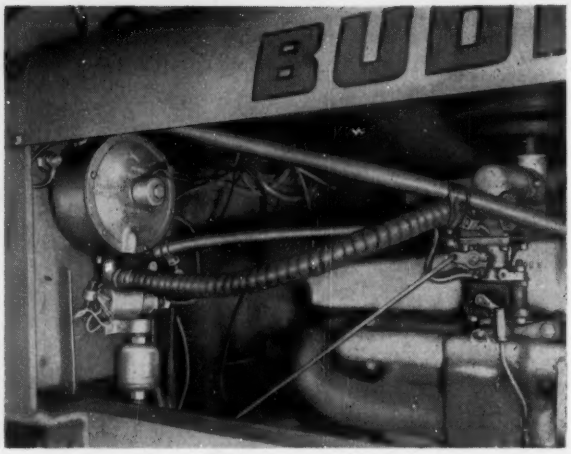
The vehicles selected for the preliminary test were typical of large groups of trucks and tugs used within the factory, and were of the same age and in approximately the same condition at the start of the test as were the comparable gasoline vehicles on which the check figures were kept. The conversion of the fleet was made on the basis of the showing that the use of propane resulted in the saving of approximately half of the cost that we had previously been paying for fuel, lubricating oil, filter changes and routine maintenance on the ignition and fuel systems of the engines. There was also clear indication that a reduction in cost of major engine overhauls would become apparent in the future. As an extra bonus the change to L. P. gas in these units resulted in eliminating complaints of unpleasant exhaust fumes—a matter which had been of considerable importance while using the same vehicles on gasoline.

Our interest in the possibility of using propane in these vehicles began with an advertisement by a major oil company in a trade magazine, recommending the use of LPG in auotmotive units as a "fuel of the future." This led us to wonder (1) why a major oil company would be promoting a product which might develop competition for its principal product, gasoline? And (2) if LPG had merit for over-the-road equipment, why wouldn't it have merit in our material handling equipment in which the excessive idling time produced a serious maintenance problem?

To find the answer to this latter question we questioned everyone whom we thought knew anything



Converted tug pulls trackless train (left) through half-mile long plant on planned route and schedule. Special orders come from dispatcher via short-wave radio.



Conversion of large tug (right) includes replacement LPG carburetor, liquid withdrawal fuel system, electrical fuel controls interlinked with ignition.

about L. P. gas, including our own fuel engineers and the representatives of all the equipment manufacturers that we could contact. There was plenty of information on the use of this fuel in outdoor vehicles, and it all seemed to point in the direction of our hopes, but there was an almost complete blank as far as actual experience with propane in indoor vehicles was concerned.

Because we could find no basis of facts on which we could either accept or discard the idea of operating our in-plant vehicles on propane, we decided to conduct a practical test on a limited scale. We selected a few units of tugs and fork trucks of similar age and condition and in identical service, and set up a test in actual factory operation for direct comparison of LPG and gasoline.

As the result of past experience and more detailed records than we now keep, we had set up a time schedule for oil changes and routine maintenance operations on the gasoline equipment. This was to be our starting point. We did not contemplate conducting a perfect engineering test, but we did want a sensible, factual answer. To this end we installed engine hour meters, expanded our maintenance records to include their readings, and arranged with a commercial laboratory to test samples of oil drained periodically from the crankcases.

We then canvassed the field of vendors to find one who could work on a complete program, qualified to:

1. Design and build a complete storage system if necessary.
2. Install the necessary conversion units for LPG.
3. Supply the fuel.
4. Under our jurisdiction, maintain liaison with our shops for the maintenance of the carburetion equipment.

Because of its ability to meet all of these requirements, we selected the American Liquid Gas Corp. to work with us on the test. This company accepted our terms, which were as follows: We would furnish the manpower and purchase the fuel and the storage equipment. American Liquid Gas would furnish the know-how and the carburetion units. We would follow its recommendations on installation and servicing of fuel systems and related matters, so it would be their trouble if it laid an egg.

The next factor was to insure proper engine maintenance, eliminating "rule of thumb" methods as well as mechanics' opinions based on recurrent ulcers, fumes, noise and inexperience with LPG. Our neutral authority on the need for maintenance operations on the engine was the Faber Laboratory, which has had extensive experience in maintenance control based on analysis of crankcase samples. Their laboratory tests give the following basic information:

1. Dilution of oil by fuel.
2. Volume of solids and amount of sludging.
3. Contamination for foreign matter.
4. Efficiency of engine operation.
5. Viscosity of oil.
6. Laboratory recommendations regarding changes of oil and filters, maintenance of fuel system, and maintenance of combustion system.

Conversions were made and the comparative tests started in October 1953. All of the units on which the

TABLE 1. COMPARISON OF FUEL AND MAINTENANCE COSTS — INDUSTRIAL TUGS

Items	Propane	Gasoline
Gallons of fuel per engine hour	1.471	1.485
Fuel cost per engine hour	$0.033	$0.086
Fuel and combustion system maintenance cost per engine hr.	$0.007	$0.015
Total cost per engine hour	$0.040	$0.101
Saving per engine hour	$0.061	—

FORK LIFT TRUCKS

Items	Propane	Gasoline
Gallons of fuel per engine hour	1.046	0.776
Fuel cost per engine hour	$0.073	$0.138
Fuel and combustion system maintenance cost per engine hr.	$0.010	$0.030
Total cost per engine hour	$0.083	$0.168
Saving per engine hour	$0.85	—

Based on a talk given at the Society of Automotive Engineers Motor Fuel Forum, Los Angeles, Feb. 29, 1956.

comparisons were made had logged approximately 1200 hours on gasoline prior to the tests. Up to May 7, 1954, only one LPG unit had required an oil change, and this was due to an error in timing which caused the crankcase to become fouled. A summary taken on Jan. 27, 1955, shows that the low record for the LPG group was an engine that had operated 3031 hours without an oil change, and the high score was 4300 engine hours without an oil change or a spark plug change. The rest of the LPG engines were within this bracket. In the gasoline group, the longest time between oil changes was 470 engine hours. More frequently it was less than 150 engine hours. (We estimate that on these vehicles one engine hour is equivalent to 30 road miles.)

As a matter of passing interest, in early November 1955, nearly 10 months later, one of the original test LPG units had gone 5325 engine hours with no oil change and no filter change, and another had gone 4582 hours with but two filter changes.

Based on our experience up to May 7, 1954, we recommended to management the conversion of the entire indoor industrial materials handling fleet of 103 vehicles. From the report on which this recommendation was based we quote the following advantages that had become apparent:

1. Compression remained high, giving better average acceleration and doing more work in less time.
2. High octane rating of fuel eliminated knocking.
3. Obnoxious exhaust odors and smoke were eliminated.
4. Less frequent oil changes reduced oil costs.
5. There was no crankcase dilution or sludging from protracted idling, which had always been a serious problem with gasoline.
6. Decreased carbon formation reduced maintenance costs.
7. Careful examination indicated that we could expect longer engine life, with less frequent and extensive engine overhauls.
8. Operating cost to date had been greatly reduced.

Peliminary tests indicated a fuel saving of $9560 per year in the 103 unit fleet

The direct comparison of fuel costs and directly related maintenance costs will be of interest. For the two groups of test vehicles they were as shown in *Table 1.*

Projecting this saving to an annual basis, calculations indicated a potential saving of $9560 per year for the entire internal fleet of 103 vehicles, based on fuel, fuel system maintenance and combustion system maintenance cost reductions only.

In addition, there was an important saving in cost of lubricating oil. A comparison made in March 1954 showed only 27 quarts of oil used in the LPG tugs, as against 103 quarts in the gasoline tugs.

The tests had substantiated all of the advantages listed except "longer engine life and less frequent and less expensive engine overhauls," which would require years of historical data to determine. Our observations indicated that such savings would develop in time, but it would take a long time. For lack of a better yardstick we estimated a 50% reduction in the major overhaul costs established by our experience on gasoline. Our subsequent experience leads us to believe that this estimate was far too conservative. We cannot yet tell how much over-allowance we made, since we have not yet needed to overhaul any of the converted engines. The estimate of annual savings that we submitted on the above basis was as shown in *Table 2.*

Against this we had to balance the cost of the necessary fuel storage and dispensing installation and the conversion of the remaining vehicles. These were estimated as shown in *Table 3.*

Since these analysis indicated that we could save the cost of the installations and conversions in two years, the conversion of the entire indoor industrial fleet was authorized. After a long period, during which all of the engineering details in connection with the conversion and the installation of the tanks and fuel equipment were worked out to the satisfaction of ourselves, the city, county and state officials and the Factory Insurance Association, the conversion was completed in January 1955. We take justifiable pride in the fact that the total cost was only $337.37 above the original estimate, and that this dif-

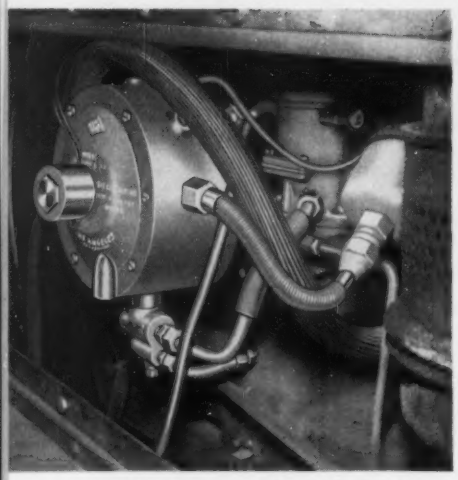
TABLE 2. SAVINGS PER YEAR —

Reduction in fuel costs	$8,150
Reduction in engine block replacement and engine overhaul	5,000
Reduced oil consumption, fuel system maintenance, combustion system maintenance	1,410
Total saving	$14,560

TABLE 3. FUEL INSTALLATION AND CONVERSION COSTS —

Installation of 10,000-gal. tank	$7,089
Pumps, meters and piping to garage	5,371
Installation of 1000-gal. tank at A-7	2,382
Labor and material for converting 103 transportation units to propane fuel	13,570
Total cost	$28,412

Tanks and two-way radio must be mounted wherever there is room on compactly designed fork lifts.



Underhood space for mounting of fuel units is limited, requiring very compact installation.

ference represents only minor engineering changes from the original plan.

It would be of great value to others contemplating the change to propane if we could give a clearcut report comparing the current experience with these 103 converted vehicles with a similar period on gasoline. It has not been possible to establish such a comparison because of changing conditions in our operation, and because of accounting procedures. For example, in our accounts the costs of all internal vehicles at our Muroc branch are included with our Santa Monica fleet. The Muroc operation is expanding rapidly, and the vehicles there are all on gasoline. Increases in engine hours are included in the "internal transportation account," yet the trend in cost is down. The payroll in the maintenance department is also down, and more of the vehicles are available for service more of the time, and this is reflected in a lowering of cost of replacement parts. Some interesting data illustrating these points were developed in the summary reports shown in *Tables 4* and 5. These compare the corresponding months in 1954 and 1955.

May we emphasize again that *Tables 4* and 5 indicate a trend in the right direction, and not a direct comparison of the cost of operating 103 vehicles on gasoline and the same 103 on propane. We like the trend, particularly since it indicates clearly that our preliminary estimates were definitely on the conservative side.

As is always the case in making any major change, we have had certain problems in connection with the conversion of our fleet. We are still working on some of them—but we had problems with these same vehicles before they were changed to propane, and LPG has been the means of licking some that were rather serious—like sludging of crankcases, and like exhaust fumes. From our own experience we would like to pass on a few suggestions to others who may be working with LPG for the first time.

Because of inexperience in the beginning, garage mechanics as well as supervisors do not have all the answers. They are likely to express opinions based on guesswork rather than on facts. Their guesses may go either way—blaming the L. P. gas switches cutting off. We have experimented with different types trying to find out what will cure the trouble. Some day next summer it may be hot enough to tell us whether we have succeeded.

We have some vehicles equipped with removable fuel containers. These were originally equipped with quick-disconnect hoses. The O-rings in the couplings gave frequent trouble, and had to be replaced at short intervals. We changed these to threaded metal connections that tighten up with a wrench. The extra time required to change tanks is insignificant, and we can't see a leaking quick connection as a proper ingredient in a safety program. We like the threaded connection better.

To summarize our experience with propane in the material handling power equipment, the change was for troubles with which it can have no possible connection, or assigning to it miraculous qualities which make all future maintenance work unnecessary. For instance, they know how often to clean a gasoline filter and carburetor, but they may think that the LPG unit will go on forever with no attention to the same parts. If they use 150 engine hours as a basis for cleaning gasoline filters, they may even think that 1200 hours on a propane filter is needlessly often.

In extremely hot weather we have experienced difficulty with solenoid not particularly difficult or expensive, and the savings in operating cost will return a substantial profit when the investment in conversion units and fuel supply system is paid off, which will not be too far in the future. The employees who use the equipment have come to regard it as safer than gasoline. The Douglas Santa Monica plant is a pleasanter place to work because of the elimination of the obnoxious fumes that were prevalent, particularly in the low-ceilinged production areas, prior to the conversion of the engines to propane. ■

TABLE 4. GASOLINE, PROPANE, OIL, 10-MONTH PERIOD —

	1954	1955
Gasoline, propane, oil	$17,187.47	$13,411.54
Engine hours	137,844	164,133
Cost per engine hour (fuel and oil)	.1246	.0817
Amount of fuel	84,500.7 gal. (3,688.4 propane)	121,905.7 gal. (20,954.8 gasoline)
Oil	7,445 qt.	4,618 qt.

(As indicated by the fuel figures, during 1954 the majority of the vehicles ran on gasoline. During 1955 the majority ran on propane.)

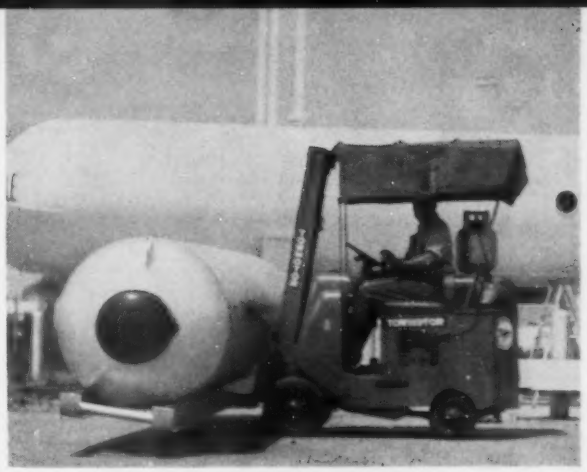
TABLE 5. THREE-MONTH COMPARISON, A/C 9053 (INTERNAL TRANSP.) —

	1954	1955
Material purchased outside	$ 9,038.97	$8,987.10
Fuel	7,163.16	5,391.65
Payroll	11,413.58	9,438.93*
Material purchased from stock	4,935.58	2,753.49
Saving on these items		$5,180.12

*Hourly rate was higher in 1955, hence saving in maintenance time was greater than indicated by cost.

This is believed to be the first forklift truck (right) to be converted to LPG, September 1951. Mutual Liquid Gas Co., Gardena, Calif.

—Photo from Paul Lady



Four ears later demand for propane systems on indoor material handling equipment (below) had led most manufacturers to offer optional fuel equipment.

FORK LIFT ROUND-UP

CONVERSION of fork lifts, industrial tugs, and other gasoline-powered industrial material handling equipment continues to be the most active phase of the L. P. gas carburetion business. Because the most important gains that can be made by operation on propane are elimination of obnoxious exhaust fumes and great reduction of expense and down-time for engine overhauls and major reconditioning operations, these conversions are feasible where fuel costs are high. Indoor vehicles are a market for carburetion equipment and LPG from one end of the country to the other—and there are hundreds of thousands of these units whose owners would like to have the operating advantages of a smoke-free fuel giving prolonged engine life and greater freedom from service interruptions. ■

Virtue Bros., manufacturers of chrome breakfast and outdoor furniture (above left), operate 14 converted fork lifts.

—Photo from Glen Filbert

Lockheed's entire fleet of mobile material handlers (below left) in their main plant at Burbank, Calif., operates on propane. Route truck brings refilled tanks to units operating beyond easy access of pump.

Crown-Zellerbach Corp. uses converted lifts (upper left) at several plants. This unit saves time unloading rolls of newsprint at San Leandro, Calif.

Ralphs Grocery Co., Los Angeles, was one of first to convert a large fleet (upper right) to eliminate exhaust fumes. Now operates 30 units on propane.

The Ford Motor Co.'s new plant (left) at Milpitas, Calif., is one of several in which this automotive giant uses propane vehicles.

—Photo from Max Barbour

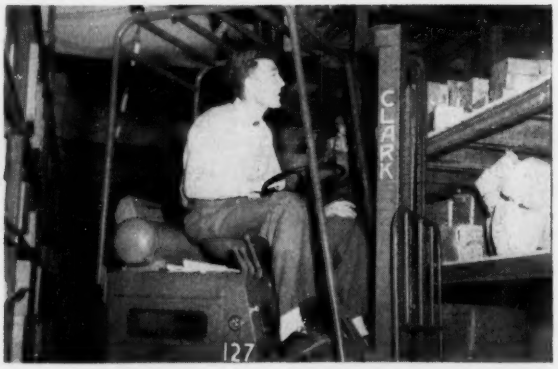
Korhumel Steel and Aluminum Co., (right) Evanston, Ill., saved $1750 in first six months on its first six converted lift trucks, mostly on maintenance—then converted the balance of its 16-unit fleet.

—Photo from Gene Creighton

Certified Grocers, Los Angeles, keeps its warehouse atmosphere free from fumes with propane lift trucks and tugs (below right)—buys fuel by the transport load.

D. L. Fair Lumber Co., (below left) Louisville, Miss., prefers propane to gasoline for lumber carriers because of reduced fire hazard—also saves on operating cost.

—Photo from R. R. Moulden

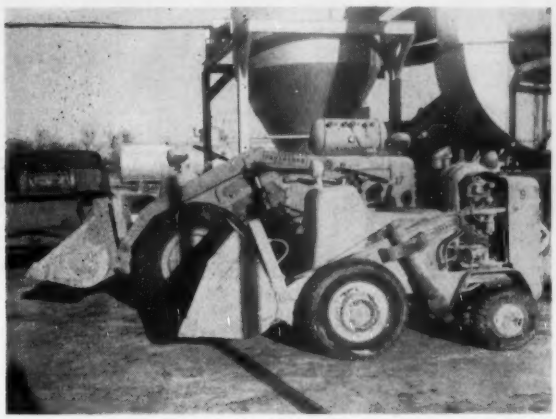


Based on report of large cost savings on this pilot conversion (right) Potlatch Forestries Inc., Lewiston, Idaho, is converting lumber carrier fleets in three of its operations in the Northwest.

—Photo from Joe Ballard, Petrolane.

These converted Payloaders (below left) load thousands of tons of fertilizer at the Simonsen continuous granulation mill at Quimby, Iowa.

—Photo from Dean Simonsen



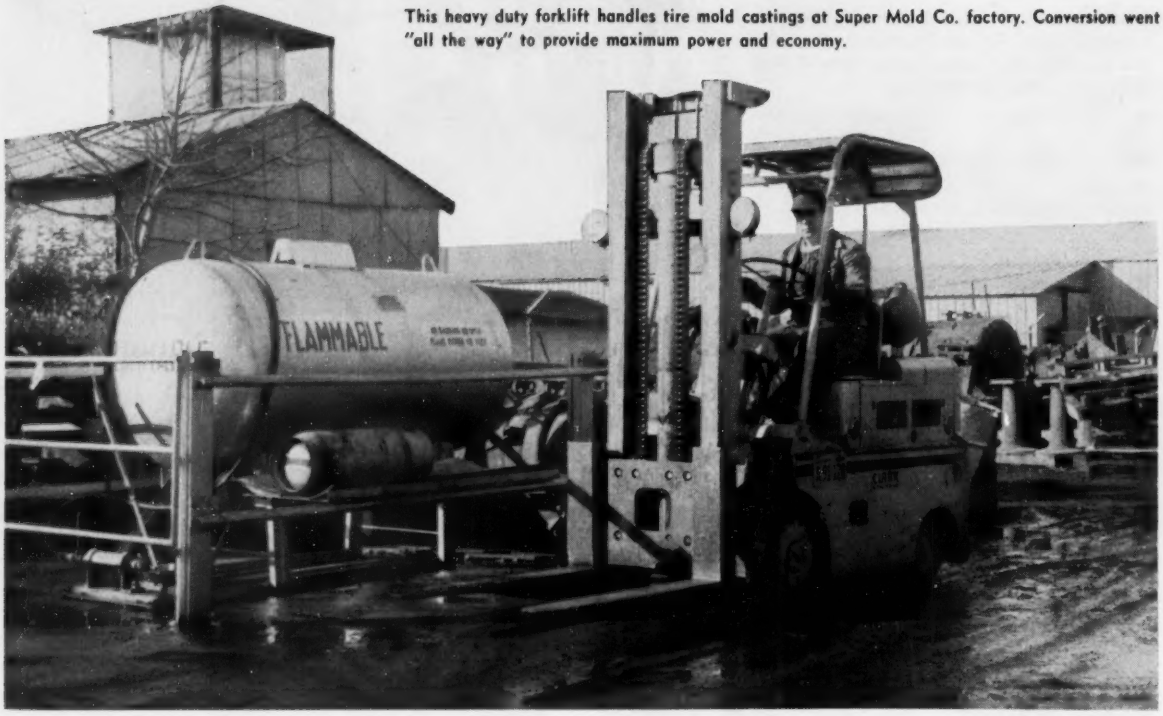
It's a stevedore, believe it or not. Converted fork-lift piles emptied pallets (below right) at Wilmington Harbor, Calif. Thousands of stevedoring trucks can be converted.

—Photo from Roy Mylander

Southwest Air Conditioning Co., (below right) Los Angeles, eliminates warehouse fume problem by using propane fork lifts.

—Photo from Roy Mylander

National Supply Co., (Below left) Torrance, Calif., has converted 25 forklifts—saves $4000 per year and eliminates irritating exhaust fumes from the factory.



This heavy duty forklift handles tire mold castings at Super Mold Co. factory. Conversion went "all the way" to provide maximum power and economy.

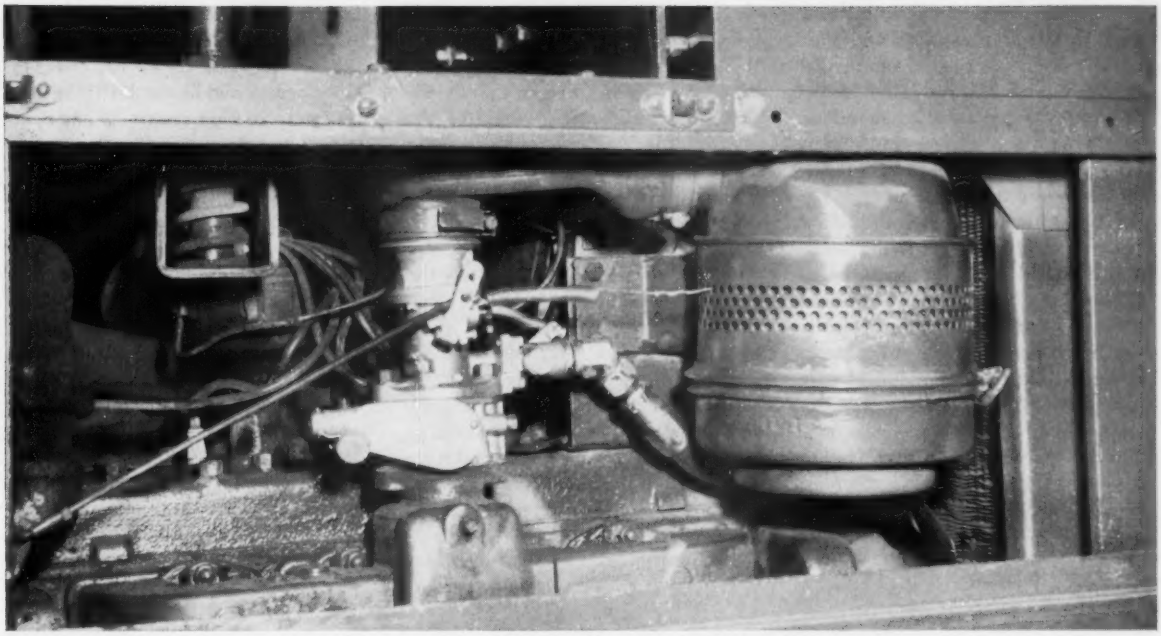
How should we make industrial truck conversions?

Operators of factories and warehouses look at many angles in considering conversion of their forklifts and industrial trucks. Cost of fuel is just one consideration—more important are freedom from obnoxious exhaust fumes and more continuous availability of the equipment. An unusually successful operator tells us in this article what the customer expects, and outlines his methods of meeting the customer's requirements.

By **FRED BURDICK** • Gray's Butane Inc., Lodi, Calif.

THERE appears to be just one primary reason why an L. P. gas dealer should be interested in the conversion of forklifts and other industrial trucks. He wants to sell the gas on which these units operate. This is not a one shot, catch-them-and-run deal. He wants to sell that gas year after year, because it is nearly always a steady load throughout the year, running to sizable volume, and it can nearly always be placed on a basis that makes for convenient delivery and low delivery costs. This adds up to a very desirable business.

Let's consider a typical average case, and figure the pay-off. An average forklift will burn from 4 to 5 gal. per day. Project that for a month and it adds up to approximately 100 gal.—1200 gal. per year. That's just one forklift. In most of the plants where conversions take place, that



A typical industrial truck conversion by Gray's Butane Inc., includes governor-equipped LPG carburetor, high compression, cool manifolds, ASME-type tank.

truck is just one of a fleet. We want the entire fleet on propane. Our way of accomplishing this objective is to do the job so thoroughly that its operation will be more satisfactory than it ever was on gasoline, and so it will continue to give that kind of service.

We also have another important reason for doing the conversion job thoroughly. We must live with the customer while trying to run our business at a profit. The need for continual service attention to existing accounts reduces that profit, and at the same time ties up the service staff so it cannot work on the development of new accounts. In self defense the gas dealer needs to make these conversions so they will run without nursing, and keep the customer happy.

The independent carburetion specialist is in a somewhat different position. He has nothing to sell but equipment and service. When the customer's fleet is converted he is through unless he is needed to overcome trouble. Nearly all of the established local carburetion people do a dependable job, and we can get along with their accounts very nicely. But there is always the hit-and-run artist from across the hill who wants to make a quick sale, a quicker installation, and get out of sight just as quickly. Their bargain basement installations generally lead to endless trouble, which the supplier of the fuel inherits. And he generally has to straighten out the mess or lose the fuel account.

We met a similar situation in past years in connection with the farmers' ditch pumps and sprinkler engines. These jobs run through the entire irrigation season—some of them day and night. Breakdowns and stops for service are serious, not only because they halt irrigation, but also because they wear out the farmer's patience. The lessons that we learned there are invlauable to us in handling the factory and warehouse transportation units, where the interruption of service by one unit may halt production of several employees, or make it impossible to maintain schedules. One of the most potent sales points that we can promise is greater freedom from the down-time for service operations and repairs that have bothered these operators with indoor gasoline vehicles. That promise can be made good only if we are thorough and particular in making the conversions.

We find that the factory managers, plant and warehouse superintendents are not only open minded in regard to the proposal that conversion jobs shall be done completely and thoroughly, but they also welcome the idea. It fits right into their operating methods. Their operating philosophy is generally, "We want the best equipment for the best price. But above all give us the best equipment." So they spend $4000 or more to buy a lift truck to speed up their operations. A saving of $50 in conversion costs is peanuts compared with the costs of unsatisfactory operation and interruption of the job that the fork lift is designed to do. Now and then a cut-rate artist snipes one of these jobs—but it would never have happened if the plant manager had been in possession of all of the facts.

We try never to recommend or perform any conversion operations that are not justified from the standpoint of economy and dependability. But there is a far greater hazard that we will try to short-cut the job here and there, and end up with a service problem, or with the need to start over and do the job right. As we go along we find out that it is better to do more rather than less. It is just like our policy on insurance. We do everything in our power to avoid the need to collect on an insurance policy, and then we pay the premium on the policy and keep it in force.

Perhaps we are pessimists, but we would rather be pessimists and stay in business than to risk becoming unemployed optimists.

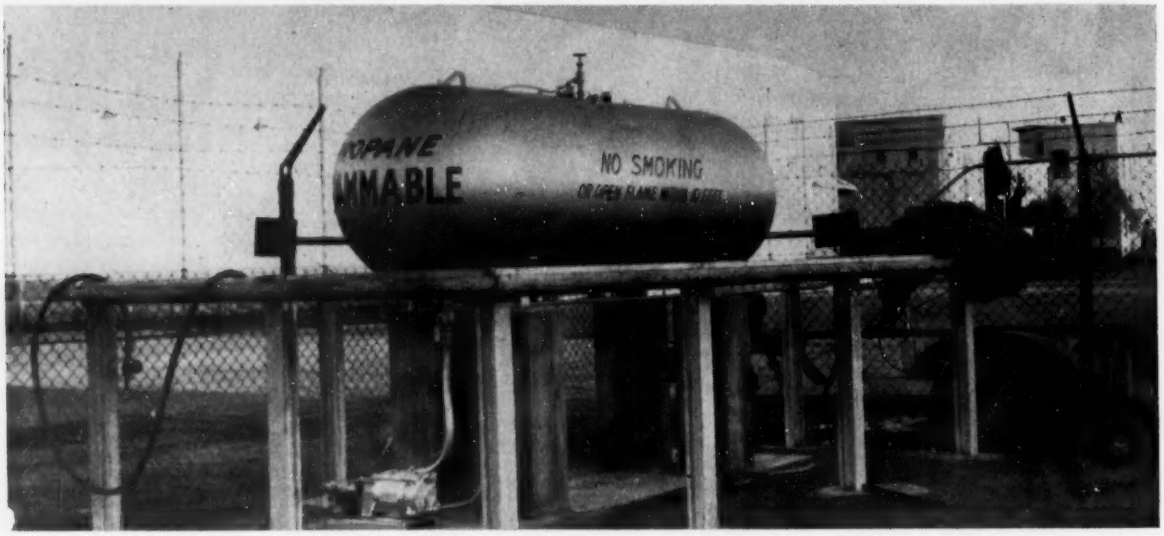
Selling conversions of these indoor fleets is quite a different problem than selling the conversion of a farmer's tractor or irrigation engine. We have found that the most productive approach is along engineering lines. Not all factories or warehouses present the same problems of use, maintenance, ventilation, and numerous other varibales. There is no point in talking to the management about troubles that do not exist. Like the family doctor, you need to diagnose the disease and write a prescription that will cure the patient's troubles. To do this, you first need to know what the troubles are. So you make a survey of the equipment, its operating conditions, maximum load requirements, idling time, crankcase problems, maintenance schedule and methods, exhaust fumes, spare units —how to handle refueling—you get the whole story. On this you can formulate a plan—in writing. It takes you out of the class of the competition that comes in with all the answers. It gives you status as a specialist with *the* answer, complete with all the costs and an evaluation of the benefits. This is the kind of proposal that the manager expects from his own organization, and appreciates from a salesman. But keep it factual. He is trained to recognize disguised bologna. And if you promise the moon, you may be expected to deliver. The other possibility is that you may be thrown out by the prospective customer.

It is amazing how much most of these factory and warehouse superintendents already know about the use of L. P. gas in indoor trucks. The trade magazines dealing with material handling have discovered the subject, and given it a lot of treatment. Many plant managers have already accumulated files of these articles, along with correspondence with organizations that have already converted their equipment. And clippings or reprints of articles that have appeared in BUTANE-PROPANE *News* are frequently encountered. For instance, at Union Ice Co., in Stockton, we found that Manager Burt Vietz had a more complete file than we had at the time of our first visit. His knowledge of the subject proved particularly valuable when it came time to convince the fire authorities and the insurance people that they should give approval. (In this case we had an extra state department to consider—the California Division of Adult Health, which has supervision over operating conditions that might affect the health of workers, and pays particular attention to conditions in the cold storage industry.)

When we first contact some of these well informed industrial prospects we get the idea that they do not know much about the subject. We find later that they are just waiting to find out if we are really equipped to handle the business, and particularly if we are ready and competent to help them with their problems of fuel supply and conversion.

We deal with one small branch of one particular combine of companies that spreads all over the United States. We found to our surprise that the conversion to propane for indoor power units is advocated by the central management authority. But the branches have not rushed out and advertised that they are ready to convert. They seem to be waiting for the right local contact in the LPG industry—one who can take the responsibility for the entire job from fuel supply to conversion of the engines and instruction of personnel. And nowhere in their book of rules is there anything that recommends chiseling on a materials handling job. In their operation products must be kept on the move, and they are only willing to gamble on the best, thereby eliminating all the gamble that they can. The first thing that an LPG man must do in selling this organization's branches is to convince the local manager that he knows what he is doing. A careful survey of the operation, such as was described in a previous paragraph, was our entree to the branch that we serve.

In our contacts with indusrtial ac-



Storage tank and protective railing engineered and installed by Union Ice Co., Stockton, to fuel forklifts working in cold storage plant.

counts, we find that the plant manager will be expecting the following results, listed in the order of their importance:

1. The reduction or elimination of carbon monoxide, smoke and obnoxious exhaust fumes. This is the primary interest of industry in converting indoor vehicles to LPG. The increased number of vehicles operating in closed areas is raising the concentration of these fumes to the point that considerations of employee health and efficiency make elimination of atmospheric contaminants necessary.

2. Lower maintenance costs, and the inevitable corollary, reduction of lost vehicle time necessary for maintenance work. In many operations the saving in maintenance cost—engine overhaul, spark plugs, oil changes, servicing of gasoline carburetors, and the cost of labor to perform these operations—is more important than the consideration of fuel cost.

3. Lower fuel cost, if at all possible. In our area we work on a price differential of four to five cents below the cost of gasoline for industrial trucks. In some areas this advantage cannot be obtained. While fuel cost is not the most important consideration with industrial trucks, we find that operators are always aware of fuel costs, and appreciate anything that can be done to hold them down, provided that the changes in the interest of economy do not cost more than they save. We have made some conversions that illustrate that last point—they operate so few hours a week that it would require many years to save enough fuel to pay the cost of high compressioning to reduce fuel consumption. The operator's problem was fumes in a poorly ventilated enclosure, and the cost of fuel was not a factor.

With all three of these considerations goes the requirement that the safety of the fuel must be at least as good as with gasoline. Fortunately, we can offer a higher degree of safety, provided that we do the job right. We must use only components that have the necessary approvals, and these must be installed in the best way possible. The installations must conform to several codes, in addition to Pamphlet 58, which is only the starting point. There are local and state fire codes, the state industrial accident commission, and, in our state, a health code. And after all these come the insurance inspectors. The installation must pass them all. To do so, it must be thorough. We can do the job as economically as possible, but it is never cheap. And since we must live with the customer after the conversion is made, we can have no part of the bargain-basement deals that will not stay in adjustment. We have replaced several of that type of carburetors with others that cost a little more to buy, but a great deal less to use. It's expensive for the operator to buy two sets of carburetor equipment to get one that wlil do his job, but that comes under the heading of "the high cost of education," and cannot be rightly charged against the cost of operating on propane.

The above are general considerations which all conversion men should use as their guide. Coming down to our actual procedure in converting these industrial trucks, our practices are based on the factors that we consider as either good engineering or just plain good business procedures.

The first consideration is that the engine of the unit to be converted must be in good condition. We have learned that there is no compromise on this. It must have tight rings, and the valves and valve guides must be in approximately new condition, and have the specfiied clearance. This insures the elimination of mechanical conditions contributing to the production of carbon monoxide and malodorous fumes. It also gives propane the opportunity to show its full advantages in prolonging engine life. LPG is a marvelous fuel, but it cannot recondition wornout parts.

Second, in nearly all cases we want to raise the compression. We have found that although the management may not tell us about it, they will nearly always run comparative figures on fuel consumption before and after conversion. If that comparison is going to be made, we will not show the best cost ratio unless we have raised the compression enough to show as good or better power factor than the engine originally had on gasoline. We believe that this factor is even more important where the cost of propane is high in relation to that of gasoline. It is least important in vehicles in limited and intermittent service, and where an unusually high percentage of time is spent under idling or minimum power conditions. There are extreme conditions of this kind under which high compression changes are not actually justified.

Third, we make it a point to cool the manifold if possible, and to the degree that is possible. On some small motors there is little or nothing that can be done about this, but on most of the larger engines in forklifts we can arrange to do so. On some, the cooling is limited to a stainless steel insert between the intake and exhaust sections to block the flow of heat around the intake passages, but in others the two manifolds can be completely separated by cutting out a section leading to the hot spot.

Fourth, we install a complete Century carburetion system, which includes the liquid fuel converter, electric fuelock, and a full L. P. gas carburetor. We prefer this to less expensive and less complete conversions because we know that its adjustments will not change in service, and that the customer will have more confidence in a thorough conversion than in what he must necessarily regard as a "cobbled up job."

Fifth, we know that the insurance carriers are going to look for underwriters' labels on all components of the conversion. There may be unapproved units that will do the job just as well—in some cases possibly even better. But it doesn't pay to agree if you can't win. We save time and temper by using underwriter-approved units and installing them with the best workmanship.

Sixth, we use ASME-type tanks, with all the gauges and valves that our past experience has proved to be valuable in giving customer satisfaction. These include the sight gauge, outage gauge, and separate fill valve and service valves. We find that these are easier to fill than the tanks that have only the single valve for filling and service, and that this saving in time will quickly pay the difference in purchase price.

Along with these better tanks we also include extra safety and protective devices in the fuel system if we

can sell the customer on their use. These include electric lock-offs, out-of-gas indicator lights, and oil-pressure operated switches that automatically turn off the fuel if the engine dies.

Seventh, we always check out the ignition thoroughly at the completion of our installation, and put it in tip-top condition. We have found that to neglect this is to invite service calls and customer dissatisfaction. The customer will seldom blame ignition trouble on the ignition system—he thinks it is something that the fuel has caused. A crippled ignition system is going to give trouble anyway, whether it is used with gasoline or propane. We sell a fuel that is supposed to eliminate many operating troubles. It is just common sense to see that it is given a chance.

Eighth, we have found that the best policy is to do our work in conjunction with the maintenance shop of the customer whose equipment we are converting. We like to have the head maintenance man and as many of the shop employees as possible work right along with us in making the conversion. We can give a great deal of instruction as we go along on the first conversion job, so that when the conversion is completed most of the mysteries of this new fuel have been disposed of. By this means we can give them an understanding of the more important factors of the conversion, and school them in the vital matters of safety. Their natural curiosity at this time enables us to give the necessary instruction much more effectively than could possibly be done in a special meeting for the purpose of giving them the same instruction.

The final job is arranging for an adequate and convenient fuel supply. Although we can deliver exchangeable tanks on a milk route basis, we prefer this to be a tank and pump located on the customer's premises, and operated by his employees. After this is installed and the employees have been given the necessary instruction, including safety practices, our part of the job is to keep the tank filled and be sure that the safety precautions are not forgotten. We also visit the operation occasionally to see that the converted vehicles continue to perform as they should. We checked back on one of our installa-

tions in Sacramento the other day, about three weeks after completing the conversion. The mechanic said, "We don't see that job any more. We have to hunt it up to check the oil." That was a job on which we had replaced a vapor spud-in system installed by the hit-and-run artist previously mentioned. Their complaint when we arranged for the installation was that they had to adjust the carburetor every morning, and if it stopped during the day they generally had to send a mechanic out to get it started. But the installation had been so cheap!

These orphaned bargain-basement installations are causing a great deal of concern not only to the LPG dealers who inherit the service problems on them, but also to the field personnel of the industrial truck and fork lift manufacturers. They do not like to see their equipment given that kind of a black eye, particularly when there are competitive units, properly converted at the factory or in the field, doing a better job over in the next warehouse.

While we have our own preferences of equipment, and our own installation practices, both of which grew out of the background of our own experience, we are quite willing to admit that differences of opinion on these matters might be justified. We go along on the basis of what has worked most satisfactorily for us. The final test of any program is, "does it work?" We know of conversions of large fleets of fork lift and industrial trucks in which none of the engines were high compressioned, none of the manifolds were cooled, and most of the carburetor attachments were spudded into gasoline carburetors—and the units are operating to the satisfaction of the owners. We believe that there were special conditions that made this possible, and that the most important of these conditions is that they were not abandoned by the people who installed them. We also believe that had these conversions been made in an area where the cost of propane more nearly approached the cost of gasoline, as is the case throughout most of the United States, the steps that were omitted would have been taken. There is no substitute for engineering the job to fit the conditions. ■

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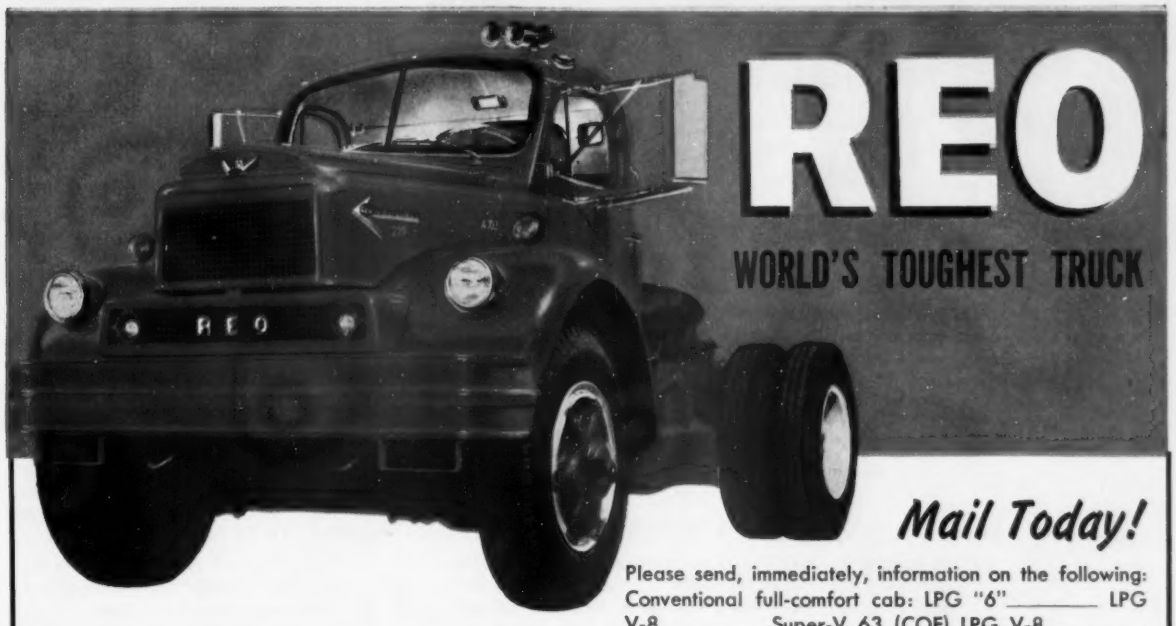

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POWER NEWS

Meeting safety requirements keeps premiums down

Strict compliance with the safety requirements of insurance companies in industrial truck conversions to L. P. gas is required for approval and will do much toward keeping premiums down and avoiding rate penalties, according to Bob Zonker, Beam Products Manufacturing Co.

Associated Factory Mutual Fire Insurance Companies have recently issued a bulletin containing recommendations for L. P. gas powered industrial trucks, which includes the following:

A. Provide a solenoid valve in the liquid line from the tank, interlocked with the ignition to close automatically when the ignition switch is "off." The design of the solenoid valve shall be such that the valve seats in the direction of normal flow when de-energized and will allow backflow through the valve in the event of excess downstream pressure.

B. Equip all replaceable tanks with a tank fuel line fitting of the quick-disconnect type that provides automatic shutoff in both directions when disconnected. The fitting should be so designed that tools are not required to make or break the connection and that there is no reasonable possibility of a defective connection.

C. Heat the vaporizer with hot water from the engine rather than with engine exhaust gases.

D. Provide a vacuum switch operated from the intake manifold and connected in series with the solenoid gas shutoff valve to prevent leakage of gas in the event the engine is left unattended with the ignition switch on. A pressure switch operated from the engine oil pressure may also be used for this purpose.

E. Provide a hydrostatic relief valve in the liquid line between the fuel tank shutoff valve and the solenoid valve located so as to discharge outside the engine compartment.

F. Equip all tanks with a liquid level gauge. Permanently mounted tanks should be equipped with either a fixed length dip tube gauge or an outage chamber in addition to the liquid level gauge arranged so that the tank will not be filled beyond the maximum filling capicities previously specified. Magnetic type liquid level gauges are preferred. Variable liquid level gauges which require venting of fuel to the atmosphere are not acceptable.

G. Equip all connections to the tank, except the relief valve and filling connections having automatic back-pressure check valves, with excess flow valves to prevent discharge of the contents in the event piping or connections are broken. Provide a manual shutoff valve on the filling connection and fuel outlet.

Subject: L. P. gas ignition requirements

Each engine has its own particular spark advance requirement, and the requirement on a L. P. gas burning vehicle varies from the gasoline engine.

Many people haphazardly give advice about setting the gasoline distributor ahead 5° or 10° for best conversion results; this may work satisfactorily on tractor or low-speed operations, but should not be used on a truck with a high-speed engine. It is true that the LPG engine can use a faster advance at low engine rpm, but this is not true at 2400 or 3000 rpm if the gasoline distributor on a conversion is advanced 10° at idle, the total advance will also be 10°

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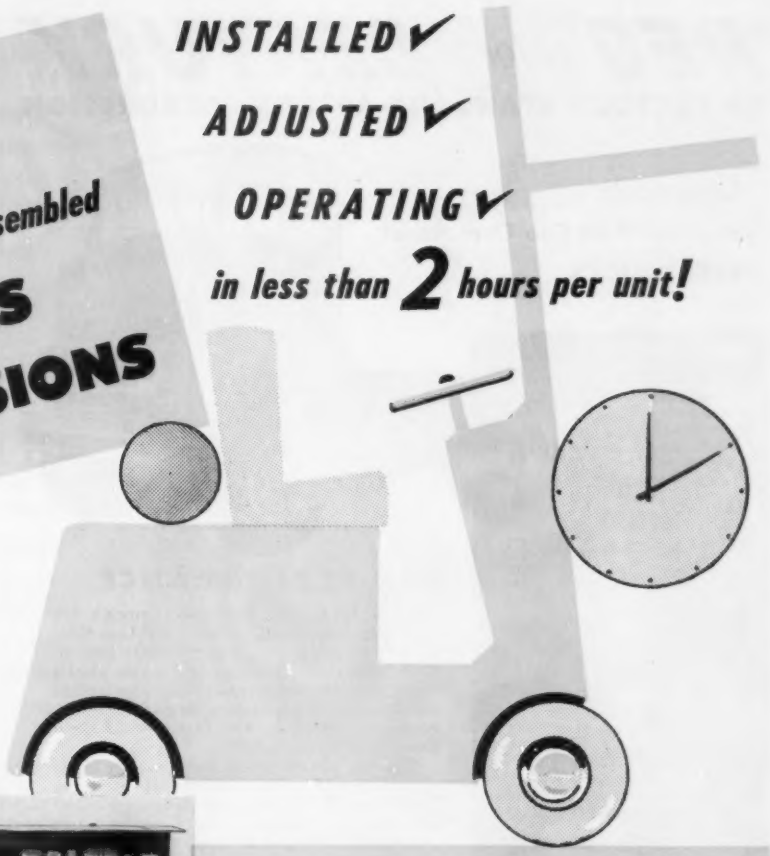

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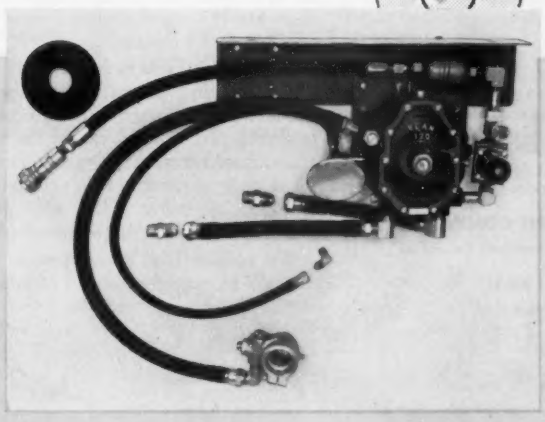

Assemblies come complete with Mounting Brackets pre-fit to specified fork lift trucks, hoses cut to proper lengths and clearly marked for speedy, simple installation.

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Just bolt the brackets, connect the hoses and install the fuel tank—in less than two hours.

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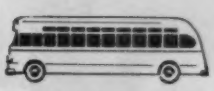

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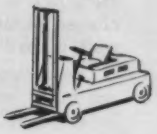

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greater and this may lead to a power loss and even damage to the engine. This can be corrected in two ways: The first and best method is to purchase a distributor designed for L. P. gas on that particular engine; the second method, if the cost is too great or there are none available, is to alter the spark curve to fit the engine. To do the latter, set your distributor for best idle and part throttle response and with a timing light record the setting; then, under full load and full rpm, reset the distributor for best power and again record this setting at idle. The difference between these two, divided by two (the distributor is turning ½ engine rpm) is the number of degrees to block off the distributor advance plate. This will not give you true overall spark requirement, but will be much more acceptable than the standard gasoline unit.

EXAMPLE: Set best idle and part throttle response and check at normal idle speed with timing light. Let us suppose it read 10° BTDC; then set for best full power performance on road or dynomometer and check with timing light at idle again. This time it may read 2° after top dead center: this means that we want to decrease the crankshaft advance 12° or 12/2 = 6° distributor.

The Delco system has a stop pin and operating plate directly below the advance weights. A bushing over this stop pin will cut down the total amount of advance. On the Holley vacuum system the advance can be changed by using stiffer springs or putting a stop on the advance plate.

We realize that many people will not go to the trouble of changing their advance curve. However, we would like you to realize that for best acceleration and power, it should be considered.

If it becomes necessary to replace a distributor on a factory equipped unit, be sure you get the L. P. gas distributors.

—From Century "News Letter"

Converting a fork lift to propane in two hours

In an effort to simplify engine conversions and save time, Beam Products Manufacturing Co. has developed a preassembled conversion that can be installed, adjusted, and operating in less than two hours. This includes mounting of the fuel tank as well, according to the manufacturer.

The entire Beam assembly (without tank) weighs just 16 lbs, ready for shipping. This includes a bracket pre-fitted to the frame of the model

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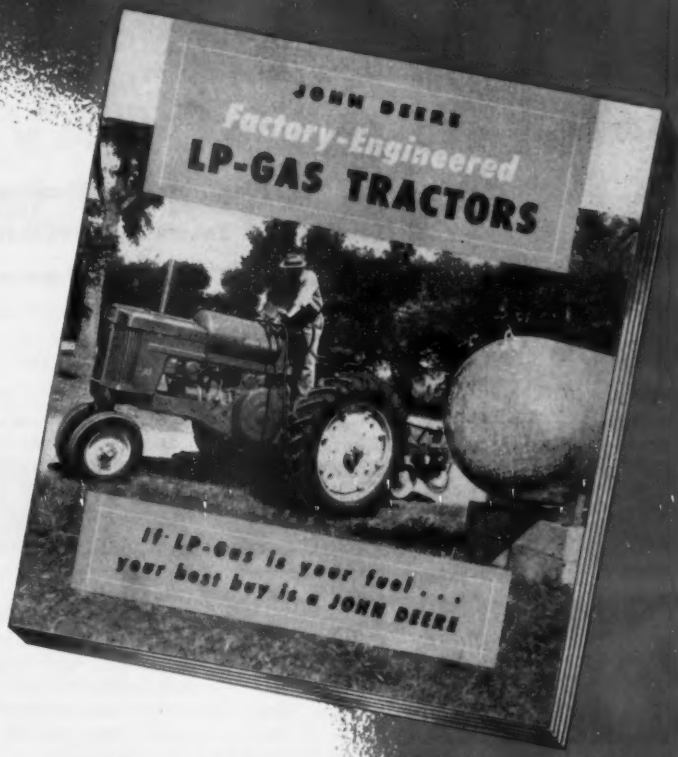
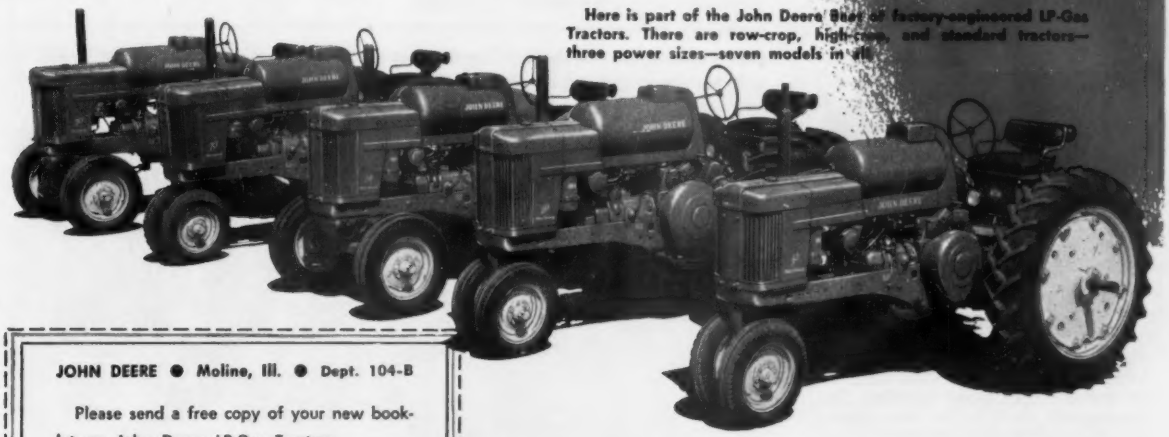


IF you sell to the farm market, here's a brand-new booklet you'll want to read. Published by John Deere and being circulated to farmers throughout the country, it points up the advantages of LP-Gas as a tractor fuel . . . encourages farmers to consult *you,* their local distributor, about the many additional uses for LP-Gas . . . about storage facilities, bulk purchases, etc.

This booklet also illustrates and describes the modern line of John Deere Factory-Engineered LP-Gas Tractors and their many special design features. It contains valuable information that should be helpful to you in talking to your farmer customers about LP-Gas Tractors. Your free copy is waiting—send for it today.



Here is part of the John Deere fleet of factory-engineered LP-Gas Tractors. There are row-crop, high-crop, and standard tractors—three power sizes—seven models in all.

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lengths and clearly labelled so that anyone who can turn a wrench can handle the installation. All components are UL approved.

During the first test run at Los Angeles the installation on a Clark fork lift was timed. One mechanic did all the work without assistance. He did not cut any corners or leave anything undone. In the 20 operations involved in making a conversion with this new assembly, the mechanic tightened every bolt, checked every connection, ran an analyzer test, and adjusted the installation with two simple adjustments which are both situated at the Beam regulator.

With the step-by-step instructions furnished by the manufacturer, the mechanic handling the conversion requires only a rudimentary knowledge of motors.

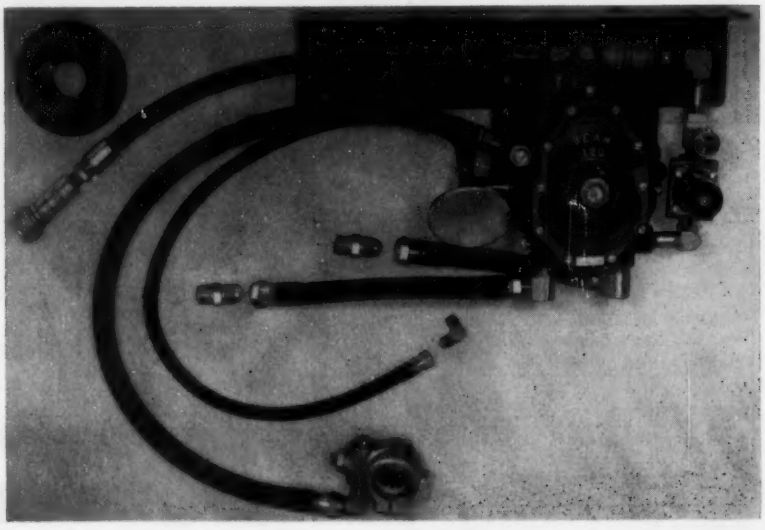
Joe Hill joins Dix as sales engineer

Joe Hill, well known through the L. P. gas industry, has joined Dix Carburetor Co., Los Angeles, as a sales engineer. C. J. Corlett, head of the Dix organization, states that Mr. Hill will spend considerable time and effort during the coming months traveling in the interest for the company.

Much of his time will be spent promoting the Dix Vigorator, which is designed to control both the rate of flow and the temperature of the engine water going through the vaporizers used in carburetion conversions.

lift to be converted and requires no drilling in the field. The assembly includes a Beam 120 regulator, vacuum safety switch, hydrostatic relief valve, solenoid valve, filter, quick coupling, proper size carburetor or carburetor adapter, and all hoses, with fittings attached, cut to proper

Beam Products now manufactures complete assemblies for the conversion of fork lift trucks to L. P. gas. Model pictured here is for a Clark and can be installed, adjusted, and operating in less than 2hr.



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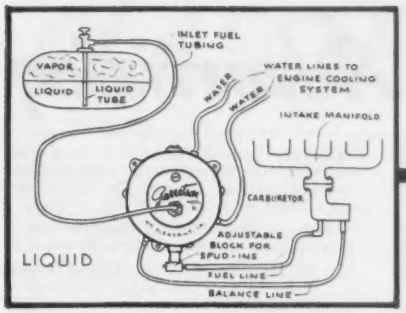
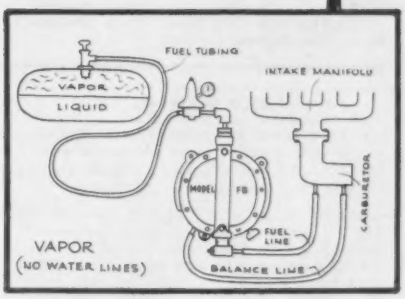


LIQUID OR VAPOR WITHDRAWAL?



By Keith Garretson, Pres., Garretson Equipment Co.

There seems to be some confusion in the industry about the advantages and disadvantages of the two systems of carburetion—liquid withdrawal and vapor withdrawal. Bulk plant operators sometimes are not sure which system to recommend to their customers. Customer satisfaction can hinge on the right choice, since neither should be used in all situations, and both have advantages.

The most popular system is LIQUID—because with this system, there is no worry about loss of vapor pressure due to cold weather, or excessive demand on a too-small tank. While these are vital factors, pressure maintenance is actually the *only advantage*, of LIQUID. If cold weather is not a factor in the installation, a large enough tank and VAPOR would probably prove more advantageous in most instances.

As a matter of fact, VAPOR has certain advantages that can't be had with LIQUID. The average engine operates in temperatures that range from 100 degrees, and above, to considerably below zero, so the incoming air varies widely in temperature. The actual operating temperature of an engine usually is thermostatically controlled. This means that when VAPOR is used, the temperature of the fuel will be approximately the same as that of the air. so the densities of the two will also be about the same. The matched densities are important to economy of operation, because this allows a good mixture of fuel and air. In LIQUID, the vapor is always heated, maintaining a steady temperature, which means densities may vary about 20% with a 100 degree change in air temperature and no change in fuel temperature. As a result, if the system is improperly set, there will be too lean a mixture in the winter, and too rich a mixture in the summer.

Here's a subject about which there is some confusion. This article explains the practical differences between the two systems of carburetion. Knowing which type to recommend is important to Bulk Plant Operators.

A second advantage of VAPOR is its ability to keep tank pressures down. And, since 92% of tractor owners refuel by the pressure differential system, it is universally advantageous for refueling—since it is easier to handle.

One of the major advantages of VAPOR is the matter of installation. VAPOR is less expensive to buy, takes less installation time, requires fewer accessories, and there is no need to switch valves for cold weather starting.

Some tractor owners make the mistake of operating on vapor with a LIQUID system. This is a serious mistake, since the vapor becomes heated, thinning it, and producing a lean mixture. This practice is the source of the rumors that VAPOR systems burn valves. Lean mixtures burn valves—*not* VAPOR systems. Vapor can be used in a LIQUID system if a valve is installed on the water line going to the vaporizer. Then, when the LIQUID valve is closed, the water valve can be closed, too.

Another misconception about VAPOR is that it tends to draw off the lighter Propane, leaving the Butane, when a mixture is used. There usually is enough tank agitation to keep the mixture constant. Even if this were a problem, it would be less than the problems stemming from those caused by temperature changes in the LIQUID system.

If cold weather is no problem, then, the bulk plant operator would do well to consider the advantages of VAPOR.

For liquid withdrawal, Garretson offers its Model K fuel controller for trouble-free, all-year carburetion. The Garretson Model FB vapor withdrawal regulator is recommended for warm weather and indoor use.

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WANTED: EXPERIENCED, ENERGETIC salesman with background in LP gas carburetion and general LP gas merchandising. Old established propane distributor west of Cascades and Pacific Northwest; also dealer of natural gas appliances. Reply in your own handwriting, stating educational background, record of employment and particular qualifications. Guaranteed salary plus commissions. Excellent opportunity. Reply Box 26, BUTANE-PROPANE News, 198 So. Alvarado St., Los Angeles 57, Calif.

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BULK PLANT MANAGER — SIX YEARS proven experience in all phases of L. P. Gas management, best references, college education, desires connection with established firm which is beginning or expanding bulk plant operations. Will relocate. Reply Box 23, BUTANE-PROPANE News, 198 So. Alvarado St., Los Angeles 57, Calif.

I BELIEVE THAT SOMEWHERE THERE IS A man who owns a successful LP-Gas business, a man who is tired of "hitting the buck" each and every day, a man who is late middle-aged and would love to spend more time in Florida. If I can find this man he will find a man who is an experienced sales engineer, married, knowledge most phases LP-Gas field. Wants opportunity to move forward into partial ownership through management arrangement over next 5-10 years. Excellent references. Apply Box 24, BUTANE-PROPANE News, 198 So. Alvarado St., Los Angeles 57, Calif.

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FOR SALE - TRUCKS - TRAILERS - Cont.

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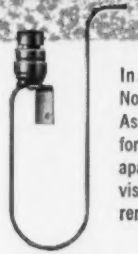

In addition to the components of the Cat. No. 30030 Assembly, the Cat. No. 30031 Assembly includes extra copper tubing for placing service-reserve indicator apart from the system in a conveniently visible location. The indicator signal reminds the user when to reorder gas.

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